Effectiveness and Efficiency Analysis of Three Methods of Lecturer and Employee Attendance at UIN Salatiga

Sulis Al Arif

Institute for Research and Community Service (LP2M) of the State Islamic University, Salatiga

ABSTRACT: This research analyzes the effectiveness and efficiency of three methods of lecturer and employee attendance used at the State Islamic University (UIN) Salatiga, namely: Squadron Android application, Smart Staff Android and iOS applications, and Fingerprint. This research uses a comparative quantitative approach with data collected through questionnaires from 76 respondents. The results of the research indicate that the Squadron Android application method has the highest level of satisfaction, accuracy, and socialization compared to other methods. However, all methods still face technical constraints, such as tool sensitivity and limited reach. This research recommends technical improvements, increased functionality, and integration of attendance systems to improve user experience. The Squadron Android application attendance method shows a higher value than Smart Staff Android and iOS applications and Fingerprint. Many respondents considered the ease of use and accuracy of the Squadron Android application attendance method better than other attendance methods.

KEYWORDS: Attendance, Effectiveness, Efficiency, Technology

I. INTRODUCTION

Presence is a system that shows a person's presence (Gunawan et al., 2021) (Darussalam & Natashia, 2020). Presence can be used as proof of a person's presence (Hamdani et al., 2024). The presence system is one of the crucial aspects in the management of the presence of lecturers and employees in the educational environment (Rafai et al., 2024). The existence of an effective and efficient attendance system plays an important role in ensuring optimal human resource management in educational institutions (Putra & Adhim, 2022) (Saied & Syafii, 2023). The presence of lecturers and employees at UIN Salatiga is a vital factor in supporting the smooth running of academic and administrative processes (Effendy & Bakti, 2019). This is because the level of discipline is one of the factors that can significantly affect the performance of lecturers and employees (Rachman et al., 2023).

Along with the development of information and communication technology, many educational institutions have begun to adopt technology-based attendance systems to replace more traditional manual attendance methods (Sunarya et al., 2019) (Magriyanti & Mustofa, 2020) (Labolo, 2019). UIN Salatiga implements three technology-based attendance methods, namely: 1) Squadron Android application, 2) Smart Staff Android and iOS applications, 3) Fingerprint. However, the use of technology in the attendance system does not always guarantee optimal effectiveness and efficiency (Ruauw et al., 2023). Factors such as technology reliability, ease of use, and integration with existing infrastructure can affect the overall performance of the attendance system (PRAYOGA & Nalien, 2023) (Wijaya & Firdaus, 2023). Therefore, an in-depth analysis of the effectiveness and efficiency of the three different attendance methods needs to be carried out to improve the existing attendance management system.

Several previous studies have highlighted problems related to attendance and attendance systems in higher education environments. Research conducted by Melinda (2019) found that by creating a mobile application for lecturer and employee attendance, the process of checking attendance data is more practical and efficient (Roedyanto et al., 2019). The web-based online attendance system for employees and lecturers can make it easier for employees and lecturers to carry out the attendance process and view attendance reports. The similarity of this study is that it conducts research on technology-based attendance systems for lecturers and employees. The difference is that this study only examines one attendance system (Veren et al., 2023).

Research conducted by Syahir (2014) found that the implementation of lecturer and employee attendance using fingerprints was quite good, but the management and synchronization process at the operational level was still not optimal. Furthermore, after fingerprints were implemented as a performance control tool, there had been no significant changes in improving the performance of lecturers and employees (Badruddin, 2014). Johan in his research found that the lecturer attendance system using web-based RFID was considered capable of supporting health protocols in universities because lecturers could input attendance by attaching an RFID-based ID card without having to crowd in line to fill out the attendance list and use the same pen together as in the old

system which was very risky for transmitting viruses between fellow lecturers. The similarity of this study is that it examines the technology-based attendance system for lecturers. The difference in this study is that it only examines one attendance system and only lecturers in the pandemic era (Johan, 2021).

Problems related to the attendance system of lecturers and employees of UIN Salatiga need attention. Therefore, this study aims to conduct an in-depth analysis of the effectiveness and efficiency of the Squadron attendance method of the Android application, Smart Staff Android and iOS applications, and Fingerprint used at UIN Salatiga. Thus, this study is expected to provide a better understanding of the management of lecturer and employee attendance at UIN Salatiga and provide recommendations for improving the existing attendance system.

II. METHOD

This study will use a comparative quantitative approach. Comparative quantitative research is a study that compares two or more different objects and compares them to find out the differences in variables between the objects studied (Harmoko et al., 2022) . This method was chosen because this study aims to compare the effectiveness and efficiency of three presence methods. Data will be collected through surveys and statistical analysis.

A. Research Object

The object of research is a scientific target to obtain data with certain goals and uses about something objective, valid, and reliable about certain variables (Sahir, 2021) . The objects of this research are lecturers and employees of UIN Salatiga.

B. Data collection technique

The data collection technique used in this study was a questionnaire with a questionnaire instrument. A questionnaire is a data collection technique that involves various questions that have been systematically arranged (Jailani, 2023) . The questionnaire was distributed to lecturers and employees of UIN Salatiga to obtain data on the three attendance methods used at UIN Salatiga.

The sampling technique in this study is simple random sampling, where all respondents are considered to have an equal opportunity to be sampled (Amin et al., 2023) . The method used in determining the sample is based on Slovin's theory with the formula:

$$n = \frac{N}{1 + Ne^2}$$

Information:

n   : number of samples

N   : population size

e: percentage of tolerance of sampling error accuracy. The provisions of e value are: e = 0.1 for large populations; e = 0.2 for small populations. So, the sample range taken from the Slovin technique is between 10%-20%.

C. Data Validity Techniques

The truth of the data obtained during the research needs to be tested for its validity (Octaviani & Sutriani, 2019) . The technique used to test the validity of the data in this study is the validity and reliability test.

1. Validity Test

Validity test is a test conducted to determine the feasibility of statement items in defining variables (Novikasari, 2016) . The testing technique in this study uses r count. Furthermore, the results of r count from the SPSS output in each statement are compared with r table $df = n - 2$ and calculate a significance level of 5% or 0.05. The number of respondents in this study was 76 people, so the r table used was 0.1876. If the r count value is greater than r table then the item is valid, conversely if r count is less than r table then the item is invalid (Budiastuti, 2022) . Furthermore, the significance level is calculated (*sig.2-tailed*). If the significance value is less than 0.05 then the item is valid, conversely if the significance value is more than 0.05 then it is said to be invalid (Janna & Herianto, 2021) .

2. Reliability Test

Reliability testing is used to measure the stability and consistency of respondents in answering questions in the questionnaire (Darma, 2021) . To test reliability in this study, Cronbach's alpha was used with an alpha value of 0.060. If the alpha value is greater than the output result, it is said to be reliable. Conversely, if the alpha value is smaller than the output result, it is declared unreliable (Darma, 2021) .

D. Data Analysis Techniques

Data analysis is the process of finding and organizing data obtained from the research process by grouping data into categories, describing them into units, organizing them into patterns, choosing which ones are important to draw conclusions so that they are easy to understand (Hastono, 2001) . The data analysis technique in this study uses descriptive statistics. Descriptive statistics are

Effectiveness and Efficiency Analysis of Three Methods of Lecturer and Employee Attendance at UIN Salatiga

statistics used to analyze data by describing the data that has been collected as it is without intending to make conclusions that apply to the public (Vivi Silvia, 2020) . Data analysis in this study uses the help of SPSS (Statistical Product and Service Solution) 21.0.

III.RESULTS AND DISCUSSION

Data collection in this study used a questionnaire to determine the effectiveness of the attendance system. The questionnaire was given to 38 lecturers and 38 employees of UIN Salatiga. The data obtained included an assessment of several aspects of the Squadron attendance method for Android applications, Smart Staff for Android and iOS applications, and Fingerprint. The following is a descriptive analysis of the data obtained regarding several aspects of the Squadron attendance method for Android applications, Smart Staff for Android and iOS applications, and Fingerprint.

Table 1. Users of the Presence Method

MetodePresensi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fingerprint	29	38.2	38.2	38.2
	Pusaka aplikasi Android dan Ios	9	11.8	11.8	50.0
	Squadron aplikasi Android	38	50.0	50.0	100.0
	Total	76	100.0	100.0	

In Table 1 it can be seen that from a total of 76 respondents, there are 29 respondents who use the Fingerprint attendance method, 9 respondents use the Smart Staff attendance method for Android and iOS applications, and 38 respondents use the Squadron attendance method for Android applications. The percentages are: 38.2% Fingerprint users, 11.8% Smart Staff users for Android and iOS applications, and 50% Squadron users for Android applications.

Table 2. Analysis of Aspects of Presence Method

Statistics

		Kepuasan	Kemudahan	Akurasi	Sosialisasi	Kendala
N	Valid	76	76	76	76	76
	Missing	0	0	0	0	0
Mean		4.50	2.47	4.66	4.22	4.04
Median		5.00	1.00	5.00	4.00	4.00
Mode		5	1	5	5	5
Std. Deviation		.872	1.637	.601	.918	1.101
Variance		.760	2.679	.361	.843	1.212
Range		4	4	2	4	4
Minimum		1	1	3	1	1
Maximum		5	5	5	5	5
Sum		342	188	354	321	307

Table 2 shows that in the aspect of satisfaction with the use of the presence method, the mean value is 4.50, the median is 5.00, and the standard deviation is 0.872. In the aspect of convenience, the mean value is 2.47, the median is 1.00, and the standard deviation is 1.637. In the aspect of accuracy, the mean value is 4.66, the median is 5.00, and the standard deviation is 0.601. Furthermore, in the aspect of socialization, the mean value is 4.22, the median is 4.00, and the standard deviation is 0.918. While in the aspect of constraints, the mean value is 4.04, the median is 4.00, and the standard deviation is 1.101.

Effectiveness and Efficiency Analysis of Three Methods of Lecturer and Employee Attendance at UIN Salatiga

Table 3. Percentage of Each Aspect of Each Presence Method

No.	Aspect	Percentage		
		Squadron Android app	Android and iOS app heritage	Fingerprint
1.	Level of satisfaction with frequently used percentage methods.	93%	91%	86%
2.	Ease of use of the presence method	51%	44%	49%
3.	Presence model accuracy	94%	93%	92%
4.	Socialization of the attendance method	87%	82%	81%
5.	Constraints in using the presence method	89%	71%	73%

Based on Table 3, it can be seen that the results of the study on the presence method show that the Squadron Android application received the highest level of satisfaction at 93%, followed by the Smart Staff Android and iOS applications with 91%, and Fingerprint at 86%. Although user satisfaction is quite high, the ease of use of these three methods is still relatively low, with the Squadron Android application reaching 51%, the Smart Staff Android and iOS applications 44%, and Fingerprint 49%. In terms of the accuracy of the presence model, all methods performed well, with the Squadron Android application recording the highest accuracy at 94%, while the Smart Staff Android and iOS applications and Fingerprint were at 93% and 92%. In addition, the socialization of the presence method also showed positive results, where the Squadron Android application got 87%, the Smart Staff Android and iOS applications 82%, and Fingerprint 81%. The obstacles faced by users of the Smart Staff Android and iOS application and Fingerprint presence methods were 71% and 73%, while the Squadron Android application had the lowest obstacles in its use at 89%.

There are three attendance methods used at UIN Salatiga, namely, Squadron Android application, Smart Staff Android and iOS applications, and Fingerprint. The Squadron Android application attendance method is the most widely used by respondents. Of the three attendance methods, the Squadron Android application attendance method is the most widely used attendance method. The second most widely used attendance method is Fingerprint, while the Smart Staff Android and iOS application attendance method is the least used.

The average user satisfaction with the attendance method is very high as indicated by a mean value of 4.50, with a median value of 5.00 indicating that half of the respondents gave the maximum value. The low standard deviation indicates that the data is fairly uniformly distributed around the mean. This reflects consistent satisfaction among respondents. Although the average assessment shows a good number, the presence of low scores indicates that not all users are satisfied. This is important for the administrators of the attendance system to note.

The average ease of use of the presence method is quite low at 2.47, and the median is much lower at 1.00. This indicates that many respondents find this method difficult to use. The high standard deviation indicates a large variation in respondents' opinions, with the majority finding it difficult.

In terms of accuracy, the mean value of 4.66 indicates that respondents generally feel that the attendance method is very accurate. The median value, which is also high at 5.00, indicates strong satisfaction among respondents. The low standard deviation indicates a uniform perception of accuracy, with little variation in answers. The mean value of the socialization aspect, which is 4.22, indicates that respondents feel that there has been good socialization regarding the attendance method used at UIN Salatiga. The median value of 4.00 also reflects a positive assessment, and the low standard deviation indicates consistency in respondents' views regarding the socialization aspect.

The mean value of 4.04 indicates that respondents acknowledged the existence of obstacles, but the assessment remained positive. The median value of 4.00 indicates that most respondents felt that the existing obstacles did not interfere too much with their experience. The moderate standard deviation indicates variation in respondents' experiences related to obstacles. Several respondents complained about technical obstacles, especially in the Finger application. The following are the obstacles conveyed by respondents when using the Fingerprint attendance method:

1. "If you use your fingers, the risk is that you sometimes have to press or rub your face repeatedly."
2. "The fingerprint machine on campus two is not very sensitive. You have to put your finger on it several times before it works. And your finger has to be wet. If it's not wet, the machine can't read it."
3. "It's time to replace the finger machines with new machines at all locations, not just the ones at campus 3.
4. "Fixing the finger attendance system in the faculty, sometimes it's hard to get in."
5. "Finger presence in Febi is very difficult, have to try several times, face scan is no longer possible."

The obstacles are not only experienced by fingerprint users, but also by Squadron Android application users. They complained that the range is still too close, which is only 100 meters. Meanwhile, users of the Smart Staff method for Android and iOS applications

also experience obstacles because the method is often down during peak hours. This shows the need for evaluation and improvement of the tools used to suit user needs.

The results of the analysis above show that the use of the presence method has different aspects in terms of respondent perception. The aspects of satisfaction and accuracy received very positive assessments, indicating that users feel significant benefits from this method. However, the low value in the ease aspect is a major concern. Many respondents feel that the existing presence method is difficult to use. This is certainly related to the constraint aspect, where the mean and median figures indicate that some respondents feel that there are problems that need to be addressed. However, the socialization aspect shows good results, indicating that there is good socialization regarding the presence method used at UIN Salatiga.

Overall, although the aspects of satisfaction, accuracy, and socialization show satisfactory results, it is important to focus on improving ease of use. Improving the ease-of-use aspect can help reduce perceived obstacles and improve the overall user experience. Improvement efforts in user training and interface design of the attendance method can be a good first step to achieve this goal. This is expected to increase the effectiveness of the existing attendance method.

In general, the Squadron Android app scored better than the Smart Staff Android and iOS apps and Fingerprint, especially in terms of ease of use and accuracy. The assessment of ease of use varied greatly, especially for the Fingerprint app. Many respondents thought that the use of this app still needed improvement, both in terms of technical and user interface. In contrast, the Squadron Android app was considered more satisfactory, with some suggestions for expanding functionality. This is because the range of the Squadron Android app is still limited to 100 meters.

Some respondents have a desire for the integration of attendance applications into one unit. It is expected that there will be a simplification of the attendance process by using one application that includes all features (leave, out of town, performance reports). This shows the need for efficiency in the administration process. This can be the focus of future development, so that users do not need to rely on several separate applications. Furthermore, efforts to improve technical problems such as applications that often experience downtime during peak hours, access speed, and the sensitivity of the attendance system will be very beneficial for all parties involved.

IV. CONCLUSION

The Squadron Android application attendance method showed a higher value compared to the Smart Staff Android and iOS applications and Fingerprint. Many respondents considered the ease of use and accuracy of the Squadron Android application attendance method better than other attendance methods. Although the existing attendance method has received positive assessments, there are still concerns about technical issues, access speed, and effectiveness of use, especially in the Smart Staff Android and iOS applications and Fingerprint. Therefore, many respondents want improvements in technical issues such as applications that often experience downtime during peak hours, access speed, and sensitivity of the attendance system, as well as the integration of attendance applications.

Based on the research results, the researcher provides suggestions to focus on technical improvements and application functionality, especially for Fingerprint and Smart Staff Android and iOS applications. This is useful for overcoming problems faced by users, such as access speed and tool sensitivity. Also consider integrating various attendance applications into one platform that includes all features, such as leave and performance reports, so that users do not have to rely on several different applications. It is better to expand the reach of the attendance area to ensure that all users can do attendance easily, especially in hard-to-reach locations. Furthermore, collect feedback from users regularly to understand their needs and problems, and adjust application development according to this input. Also provide socialization and training to users on how to use the application effectively, so that they can maximize the function of the existing attendance method.

REFERENCES

1) Amin, NF, Garancang, S., & Abunawas, K. (2023). General concepts of population and sample in research. *Pillar* , *14* (1), 15–31.
2) ARDIANTO, S. (2022). *Lecturer Attendance System Based on Mobile Application of Sultan Agung Waqf Foundation Using* Geolocation.
3) Ardianto, S., Subroto, IMI, & Haviana, SFC (2023). College Employee Attendance Based on Mobile Application Using Geolocation and Biometric Verification. *TRANSISTOR Electrical and Informatics* , *4* (3), 181–189.
4) Azis, N., Pribadi, G., & Nurcahya, MS (2020). Analysis and Design of Android-Based Basic English Learning Application. *IKRA-ITH INFORMATIKA: Journal of Computers and Informatics* , *4* (3), 1–5.
5) Badruddin, S. (2014). Effectiveness of Finger Print Implementation at IAIN Raden Fatah Palembang. *Wardah* , *15* (1), 33–34.
6) Budiastuti, D. (2022). *Validity and reliability of research* .

7) Darma, B. (2021). *Research Statistics Using SPSS (Validity Test, Reliability Test, Simple Linear Regression, Multiple Linear Regression, t-Test, F-Test, R2)* . Guepedia.

8) Darussalam, U., & Natashia, ND (2020). Fingerprint Attendance System Based on Android Smartphone. *JIMP-Journal of Informatics Merdeka Pasuruan* , *5* (1).

9) Effendy, I., & Bakti, AM (2019). Smart Attendance Integration for Lecturers as an Effort to Improve Performance. *Klik-Kumpulan J. Comput Science* , *6* (3), 317–326.

10) Fansury, AH, Rahman, MA, & Jabu, B. (2021). *Developing mobile English application as teaching media: Developing English language applications as learning media* . Deepublish.

11) Gumelar, W. (2019). *Lecturer and Staff Attendance System Using GPS Based on Mobile Device Fingerprint* .

12) Gunawan, R., Yusuf, AM, & Nopitasari, L. (2021). Design and Construction of Student Attendance System Using Android-Based Qr Code. *Elkom: Journal of Electronics and Computers* , *14* (1), 47–58.

13) Hamdani, D., Wibowo, APW, & Heryono, H. (2024). Design of Online Attendance System with QR Code Using Prototyping Method. *Journal of Technology and Information* , *14* (1), 62–73.

14) Harmoko, MP, Kilwalaga, I., Pd, SPI, Asnah, S., Rahmi, S., Adoe, VS, SP, M., Dyanasari, I., & Arina, F. (2022). *Research methodology textbook* . Feniks Muda Sejahtera.

15) Hastono, SP (2001). Data analysis. *Depok: Faculty of Public Health, University of Indonesia* , 1–2.

16) Hernawan, D., & Pratidina, G. (2024). Effectiveness of Implementing Online Attendance for ASN Employees on the Super Apps Smart Staff Application (Case Study: Bogor Regency Ministry of Religion Office). *Karimah Tauhid* , *3* (4), 3990–4003.

17) Jailani, MS (2023). Data collection techniques and instruments for scientific educational research using qualitative and quantitative approaches. *IHSAN: Journal of Islamic Education* , *1* (2), 1–9.

18) Janna, NM, & Herianto, H. (2021). *The concept of validity and reliability testing using SPSS* .

19) Johan, TM (2021). Lecturer Attendance System Using RFID to Support Less Contact-Based Higher Education Administration During the Covid-19 Pandemic. *Tika Journal* , *6* (03), 270–276.

20) Kusuma, IWWN, Putra, IGJE, & Nirmala, BPW (2021). GuideAR: An Augmented Reality and Global Positioning System-Based Application for Tourist Attraction Recognition. *KARMAPATI (Collection of Articles by Informatics Engineering Education Students)* , *10* (1), 78–87.

21) Labolo, I. (2019). Implementation of QRCode for Student Lecture Attendance Based on Paperless Office. *Upgris Informatics Journal* , *5* (1).

22) Magriyanti, AA, & Mustofa, Z. (2020). Implementation of Student Attendance Information System Using Fingerprint Integrated with SMS Gateway. *Journal of Information and Communication Technology* , *11* (1), 56–66.

23) Maulidya, NP, Larassaty, AL, & Pujianto, WE (2021). The Effect of Implementation of Fingerprint Attendance, Sanctions, and Motivation on Employee Work Discipline at Intako. *Greenomika* , *3* (2), 88–96.

24) Meyliana-UBSI, A. (2020). Design of Employee Attendance Information System with Prototype Method Using Fingerprint. *SPEED-Sentra Penelitian Engineering Dan Edukasi* , *12* (2).

25) Novikasari, I. (2016). Instrument Validity Test. *Purwokerto: State Islamic Institute of Purwokerto* , *56* .

26) Nuantra, VA, Sacky, MR, Kristianto, W., Fadillah, MR, Mahmudah, MJ, Hanif, SAC, & Yuamita, F. (2022). Usability Testing Factors for the Use of Attendance on the SIA UTY Website. *Journal of Applied Industrial Technology and Management* , *1* (3), 173–182.

27) Nugraha, AK, Satoto, KI, & Kridalukmana, R. (2014). Design of Bubble Letter Game (Wayang Character) Based on iOS Operating System Using Gamesalad. *Journal of Computer Technology and Systems* , *2* (1), 1–10.

28) Octaviani, R., & Sutriani, E. (2019). *Data analysis and data validity checking* .

29) PRAYOGA, DP, & Nalien, EM (2023). Factors Influencing the Success of Implementing the Use of Online Presence. *Minangkabau Government Applied Journal* , *3* (1), 18–27.

30) Priyambodo, A., Usman, K., & Novamizanti, L. (2020). Implementation of Android-Based QR Code in Attendance System. *J. Technol. Inf. And Comput Science* , *7* (5).

31) Putra, YWS, & Adhim, MF (2022). Online Attendance Information System Using Face Recognition and GPS Technology. *Jurnal Tekno Kompak* , *16* (1), 149–161.

32) Rachman, A., Dunggio, T., & Rachman, AA (2023). The Influence of Discipline on Employee Performance. *Bisnisman Journal: Business and Management Research* , *5* (1), 143–151.

33) Rafai, M., Solikhun, S., & Safii, M. (2024). Design of Website-Based Student QR Code Attendance at Stikom Tunas Bangsa Pematang Siantar Using Agile Method. *Jayakarta Informatics Management Journal* , *4* (1), 51–60.

34) Rahmawati, SR, & Purwadhi, P. (2020). The Influence of the Effectiveness of Fingerprint Attendance and Incentive Implementation on FPOK UPI Employee Discipline. *Service Management Triangle: Journal of Service Management* , *2* (1).

35) Riyanti, AS, Pramono, J., & Sugiyarti, SR (2023). The effectiveness of the implementation of the presence system in employee work discipline within the Klaten Regency Personnel and Human Resources Development Agency. *Solidaritas: Journal of Social Sciences* , *7* (2).

36) Roedyanto, MC, Andjarwirawan, J., & Noertjahyana, A. (2019). Mobile Application for the Attendance System of Lecturers and Employees of Petra Christian University. *Infra Journal* , *7* (1), 102–107.

37) Ruauw, G., Tumbel, GH, Kawahe, M., & Lumingkewas, E. (2023). Implementation of Electronic-Based Attendance. *Scientific Journal of Regional Government Administration* , *15* (2), 237–249.

38) Sahir, SH (2021). *Research methodology* . KBM Indonesia Publisher.

39) Saied, M., & Syafii, A. (2023). Design and Implementation of the Latest Technology-Based Attendance System to Improve the Efficiency of Employee Attendance Management in Companies. *Indonesian Engineering Journal* , *2* (3), 87–92.

40) Saputra, R., & Fadtha, TSE (2014). Islamic Daily Prayer Application on Android Operating System. *Science and Information Technology* , *3* (1), 80–84.

41) Semi, H. (2024). Implementation of Fingerprint Technology in Improving Teacher Discipline. *Kelola: Journal of Islamic Education Management* , *9* (1), 1–11.

42) Sihotang, YS, Sitanggang, MSH, Purba, M., & Tarigan, LL (2024). The Role of Online Attendance Effectiveness in Supporting Employee Performance at the Regional Office of the Directorate General of Treasury, General Affairs, North Sumatra Province. *Skylandsea Professional Journal of Economics, Business and Technology* , *4* (1), 35–41.

43) Sinurat, EA, Siahaan, YD, Saribu, AD, Pardosi, RW, Manurung, V., Ompusunggu, JP, Saragi, KS, Zai, PF, & Silitonga, CEJ (2024). UTILIZATION OF MARKETING COSTS TO IMPROVE EFFICIENCY, EFFECTIVENESS AND PRODUCTIVITY BASED ON DEA. *Competitive Accounting Journal* , *7* (2), 204–212.

44) Steers, R. M. (1976). When is an organization effective? A process approach to understanding effectiveness. *Organizational Dynamics* , *5* (2), 50–63.

45) Sunarya, PA, Febriyanto, E., & Januarini, J. (2019). Mobile Application for Employee Attendance and Leave Submission Based on GPS. *CCIT Journal* , *12* (2), 241–247.

46) Veren, S., Sari, RP, & Febriyanto, F. (2023). Web-Based Online Attendance System for Employees and Lecturers. *Journal of Information Systems and Technology* , 33–40.

47) Vivi Silvia, S. (2020). *Descriptive Statistics* . Andi Publisher.

48) Wijaya, SW, & Firdaus, M. (2023). *Design and Construction of an Online Attendance Application Information System with an Agnostic Platform* . *2* (1), 795–809.