



The Effect of Fingerprint Attendance System Implementation on Civil Servants' Work Discipline at the Makassar City Manpower Office

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ABSTRACT

This study investigates the effect of fingerprint attendance system implementation on the work discipline of civil servants at the Makassar City Manpower Office. Although biometric attendance systems have been widely adopted in public sector organizations, empirical findings regarding their effectiveness remain inconsistent, particularly within local government institutions. This study employs a quantitative explanatory approach using a saturated sampling technique involving 57 civil servants. Data were collected through structured questionnaires, observations, and documentation, and analyzed using simple linear regression with SPSS version 27. The results reveal that the implementation of the fingerprint attendance system has a positive and significant effect on employee work discipline, as indicated by a t-value of 6.767, which exceeds the critical value of 1.673, with a significance level of 0.000. The regression coefficient shows that improvements in the implementation of biometric attendance systems are associated with increased employee discipline, particularly in terms of punctuality, compliance with attendance schedules, and adherence to organizational regulations. The coefficient of determination (R^2) indicates that 45.4% of the variation in work discipline is explained by the fingerprint attendance system. These findings highlight the role of digital attendance systems as effective managerial control mechanisms in enhancing accountability and discipline within public sector organizations. The study contributes to human resource management literature by providing empirical evidence from a local government context and offers practical insights for policymakers to optimize attendance systems and strengthen organizational discipline.

1. Introduction

The rapid development of information and communication technology in the era of globalization has significantly transformed organizational management practices, particularly in the public sector. Organizations are increasingly required to improve effectiveness, efficiency, and accountability in managing human resources to achieve institutional goals. Human resources (HR) are recognized as strategic assets that determine organizational success because employees play a central role in implementing policies, delivering services, and maintaining operational sustainability. Consequently, organizations must adopt modern management systems capable of enhancing employee productivity, responsibility, and discipline (Maulidya, 2021). One important aspect of human

resource management is work discipline, which reflects employee awareness and willingness to comply with organizational rules and regulations. According to Cahyani (2021), work discipline demonstrates individual obedience toward organizational norms and responsibilities, while Syarifudin (2024) explains that discipline encourages employees to perform tasks effectively in accordance with institutional expectations.

In public sector institutions, employee discipline is closely associated with attendance management because attendance reflects employee commitment, punctuality, and accountability in carrying out duties. Attendance systems therefore become an essential managerial tool for monitoring employee presence and ensuring compliance with organizational regulations. Rahmawati (2020) states

that attendance systems contribute to the creation of an orderly and efficient working environment by supporting employee monitoring and organizational productivity. In recent years, many organizations have shifted from manual attendance systems to biometric-based systems such as fingerprint attendance. Fingerprint attendance systems utilize biometric technology to record employee attendance accurately using fingerprint verification, thereby reducing the possibility of manipulation and increasing transparency in attendance monitoring (Alexandra, 2024). Compared with conventional attendance systems, fingerprint attendance systems are considered more reliable because each employee possesses unique biometric characteristics that cannot easily be falsified.

The implementation of fingerprint attendance systems has become increasingly common in Indonesian public institutions, including government agencies. One of these institutions is the Makassar City Manpower Office, which is responsible for employment-related services, workforce development, and labor protection policies in Makassar City. As part of efforts to improve employee discipline and organizational effectiveness, the institution has implemented a fingerprint attendance system for civil servants (ASN employees). The system is expected to encourage punctuality, strengthen accountability, and improve attendance accuracy. However, despite the implementation of the fingerprint attendance system, disciplinary issues among employees remain evident. Attendance recap data for 2024 indicate recurring cases of lateness and unexplained absences.

Table 1. Recap Attendance of Civil Servants of the Makassar City Manpower Office for the 2024 Period

Month	Late	Without Information
January	57	14
February	48	9
March	47	8
April	44	4
May	44	5
June	42	5
July	46	4
August	46	2
September	43	0
October	46	1
November	41	1

Source: General and Personnel Sub-Section

Based on Table 1, the attendance level of ASN employees at the Makassar City Manpower Office during the 2024 period remains less than optimal. The highest number of lateness cases occurred in January with 57 cases, while the lowest occurred in November with 41 cases. Unexplained absences were also recorded throughout the year, with the highest number occurring in January with 14 cases, while no unexplained absences were reported in September. These findings indicate that employee discipline, particularly punctuality and attendance compliance, still requires improvement despite the implementation of fingerprint attendance technology. Ideally, fingerprint attendance systems should improve employee discipline by encouraging accountability and adherence to working hours. However, the persistence of lateness and unexplained absences suggests that the implementation of the system has not yet fully achieved the expected disciplinary outcomes.

Previous studies have extensively examined the relationship between fingerprint attendance systems and employee work discipline. Kamal et al. (2020) found that fingerprint attendance systems significantly improved employee discipline at the Ministry of Communication and Informatics in Jakarta. Similarly, Fadila and Septiana (2019) reported that fingerprint attendance implementation positively influenced employee discipline at the Batam Business Agency. Azizah et al. (2022), Maulidya et al. (2021), and Kurniawan and Usuluddin (2021) also emphasized that biometric attendance systems contribute positively to employee discipline and organizational control. These studies generally conclude that fingerprint attendance systems improve attendance accuracy, reduce attendance fraud, and encourage employee compliance with working hours.

Nevertheless, inconsistencies remain in the empirical findings. Malombeke et al. (2024) revealed that the effectiveness of biometric attendance implementation did not significantly affect employee discipline at Fellow Coffee. This inconsistency suggests that the effectiveness of fingerprint attendance systems may vary depending on organizational characteristics, work environments, managerial supervision, and

employee motivation. In addition, most previous studies focused on private organizations or institutions outside the Makassar regional government context. Limited studies have specifically examined the effectiveness of fingerprint attendance systems in improving work discipline among civil servants within local government institutions in Makassar City. Therefore, there remains a contextual and empirical gap regarding how fingerprint attendance systems influence ASN work discipline in regional government agencies.

Based on these gaps, the research problem in this study is formulated as follows: *Does the implementation of the fingerprint attendance system significantly influence the work discipline of civil servants at the Makassar City Manpower Office?* This problem formulation emerges from the persistent disciplinary issues observed despite the implementation of biometric attendance technology.

Accordingly, this study aims to examine the effect of fingerprint attendance system implementation on the work discipline of civil servants at the Makassar City Manpower Office. Specifically, the study investigates whether the implementation of fingerprint attendance contributes positively and significantly to employee discipline.

Theoretically, this study contributes to the development of human resource management literature, particularly regarding the role of biometric attendance systems in strengthening employee discipline within public sector organizations. The findings enrich empirical discussions concerning technology-based attendance systems and organizational behavior in government institutions. Practically, this study provides important implications for policymakers and managers in public institutions by offering insights into the effectiveness of fingerprint attendance systems as managerial control mechanisms. Furthermore, the study may serve as a reference for improving attendance policies, strengthening supervision, and enhancing employee discipline within government agencies. The novelty of this study lies in its focus on the implementation of fingerprint attendance systems within the context of ASN employees at the Makassar City Manpower

Office, an area that remains underexplored in recent empirical literature.

1. Literature Review

2.1 Conceptual and Theoretical Foundations

2.1.2 This Management Human Resources

Management is the process of planning, organizing, directing, and controlling various source resources (human, financial, material, and information) to reach objective organization in a way effective and efficient. This involves taking decision strategic and operational as well as coordination activity for ensure that all over part organization Work in a way harmonious. Management Human Resources (HRM) is science and methods management relationships and roles individual in a way efficient and effective for optimize it in reach objective organization together. HRM involves related activities with procurement, coordination, and development source Power humans (Gifelem, 2022). According to Umi in Puspaningrum (2019), HRM in general special focuses on personnel management, employment, and utilization strategies source Power man in a way effective for reach objective organization at a time ensure satisfaction for all parties involved.

Based on the above opinion, can concluded that HRM is something discipline purposeful science for manage and optimize roles and relationships individual in something organization. HRM includes design and coordination related activities with recruitment, utilization, and management source power man for reach objective organization in a way effective and efficient. Source power good people also contribute significant to success organization with increase productivity, efficiency, and achievement purpose. According to Hasibuan in Gifelem (2022), the objectives of HRM include:

- a. Determine amount required staff for every position in organization.
- b. Ensure availability power Work good in the present and the future come.
- c. Prevent occurrence mismanagement and overlapping overlap task in implementation work.
- d. Make it easy coordination, integration, and synchronization for increase productivity.

- e. Avoid lack or excess employee with still directing recruitment, selection, development, compensation, and termination programs.
- f. Become reference in taking decision promotion, transfer and retirement employee.
- g. Set base evaluation performance employee.

2.1.2 Implementation Fingerprint Attendance

Monitoring presence is very important for track presence employees, discipline, and for taking decision related salary, evaluation performance and assessment others (Oktafiana et al., 2020). One of the system high absenteeism adopted is absence fingerprints finger. Attendance fingerprints finger is system based biometrics that record presence employee with detect fingerprints fingers (Puspaningrum, 2019). Works for take notes time in and out in a way automatic, guarantee data accuracy and prevent manipulation (Saputri, 2024). System This is effective tool for monitor presence, upholding discipline, and ensure compliance with working hours (Maulidya, 2021). According to Kurniawan (2021), the goal implementation absence fingerprints finger among others:

- a. Increase productivity employee through improvement discipline presence.
- b. Simplify tracking presence and increase efficiency reporting.
- c. Support paperless system for reduce material and operational costs.
- d. Providing discipline data comprehensive staff for evaluation performance and assessment loyalty.

According to Decaprio (2023), the factors following influence choice system absence fingerprints finger:

- a. Characteristics fingerprints unique fingers prevent duplication
- b. Remove possibility occurrence fraud report presence.
- c. Convenience use — employees only need register fingerprints his finger without bring card.
- d. Security high — no no one can falsify or manipulate notes presence.
- e. Prevent data misuse and recording presence without permission.
- f. Reduce related manual work tracking presence.
- g. Ensure recording accurate and reliable attendance reliable.

- h. Increase efficiency and saving time.
- i. Support improvement discipline work.

2.1.3 Discipline Work

Discipline Work refers to employee moral awareness and obedience to rules and procedures in place work (Sanjaya, 2024). This reflects not quite enough answer employee in guard efficiency and quality work. Discipline Work strengthen commitment and compliance to objective organization (Agustini, 2019). Organizations need clear rules that must be followed obeyed by employees. According to Kurniawan (2021), the regulations the among others:

- a. Provision check-in, check-out, and break times.
- b. Rule dress and standards behavior on the spot work.
- c. Procedure implementation work and interaction between department.
- d. Regulation about permitted and prohibited activities in organization.

2.2 Review of Empirical Studies

Numerous empirical studies have investigated the influence of fingerprint attendance systems on employee work discipline. Kamal et al. (2020) examined the effect of fingerprint attendance systems on employee discipline at the Ministry of Communication and Informatics in Jakarta. The study found that fingerprint attendance implementation had a positive and significant effect on employee discipline, indicating that biometric systems improve attendance compliance and punctuality.

Similarly, Fadila and Septiana (2019) reported that the implementation of fingerprint attendance systems significantly improved employee discipline at the Batam Business Agency. Their findings showed that fingerprint attendance systems contributed positively to attendance monitoring and employee accountability, although the effectiveness of implementation had not yet reached its maximum potential.

Azizah et al. (2022) also found that fingerprint attendance implementation positively influenced the work discipline of state civil apparatus employees in the Bandar Lampung City Secretariat. Likewise, Kurniawan and Usuluddin (2021) demonstrated that fingerprint attendance systems significantly improved employee work

discipline at the Palembang Health Training Center. Their study emphasized that biometric attendance systems strengthen organizational supervision and encourage compliance with working hours.

Other studies further support the importance of biometric attendance systems in improving employee discipline. Maulidya et al. (2021) identified that fingerprint attendance implementation, sanctions, and motivation significantly affected employee work discipline. Oktafiana et al. (2020) also explained that fingerprint attendance systems improved organizational effectiveness in attendance monitoring and employee supervision. Alexandra et al. (2024) found that biometric attendance systems positively influenced employee discipline and performance within the Aceh Public Works and Spatial Planning Service.

Despite these positive findings, inconsistencies remain within the literature. Malombeke et al. (2024) found that the effectiveness of biometric attendance implementation did not significantly influence employee discipline at Fellow Coffee. Their study indicated that employee motivation and job satisfaction played more dominant roles in influencing discipline compared to biometric attendance systems alone. These inconsistent findings suggest that the effectiveness of fingerprint attendance systems may vary depending on organizational context, managerial supervision, organizational culture, and employee characteristics.

Methodologically, most previous studies employed quantitative approaches using regression analysis to examine the relationship between fingerprint attendance systems and work discipline. However, prior studies were largely conducted within private organizations or institutions outside the regional government context, limiting empirical understanding of fingerprint attendance implementation within local public sector organizations.

2.3 Identification of the Research Gap

Based on the synthesis of theoretical perspectives and empirical findings, several research gaps can be identified. First, previous studies predominantly focused on private organizations or government institutions outside the Makassar regional government context. Limited empirical studies specifically examine the implementation of

fingerprint attendance systems among civil servants within local government institutions in Makassar City.

Second, empirical findings regarding the effectiveness of biometric attendance systems remain inconsistent. While studies conducted by Kamal et al. (2020), Fadila and Septiana (2019), and Azizah et al. (2022) found significant positive relationships between fingerprint attendance systems and employee discipline, Malombeke et al. (2024) reported insignificant effects. These inconsistencies indicate that the relationship between fingerprint attendance systems and work discipline may depend on contextual and organizational factors.

Third, previous studies have primarily emphasized attendance effectiveness without comprehensively examining the persistence of disciplinary issues such as lateness and unexplained absences after biometric attendance systems are implemented. Therefore, further investigation is necessary to determine whether fingerprint attendance systems effectively improve ASN employee discipline within regional government institutions.

Based on these gaps, this study contributes to the literature by examining the influence of fingerprint attendance system implementation on the work discipline of ASN employees at the Makassar City Manpower Office. This study provides contextual evidence regarding biometric attendance systems within Indonesian local government institutions and strengthens empirical discussions concerning technology-based discipline management in the public sector.

2.4 Development of the Conceptual Framework

This study examines the relationship between fingerprint attendance system implementation as the independent variable and employee work discipline as the dependent variable. Fingerprint attendance systems are considered managerial control mechanisms that improve attendance transparency, punctuality, and accountability. Effective implementation of biometric attendance systems is expected to encourage employees to comply with organizational rules and working hours.

Work discipline reflects employee obedience toward institutional regulations, punctuality, and responsibility in carrying out organizational duties.

Employees who comply with attendance procedures and working schedules are considered more disciplined and productive in supporting organizational performance.

Previous empirical findings generally indicate that biometric attendance systems positively influence employee discipline because attendance records become more accurate, transparent, and difficult to manipulate. Consequently, improved attendance monitoring is expected to strengthen employee compliance and organizational discipline.

The conceptual relationship in this study can therefore be illustrated as follows:

**Fingerprint Attendance System
Implementation (X) → Work Discipline of Civil
Servants (Y)**

2.5 Hypotheses or Research Propositions

Based on the theoretical foundations, empirical studies, and conceptual framework discussed above, the following research hypothesis is proposed:

The implementation of the fingerprint attendance system has a positive and significant effect on the work discipline of civil servants at the Makassar City Manpower Office.

3. Research Methods

3.1 Research Design

This study employed a quantitative explanatory research design to examine the effect of the implementation of a fingerprint attendance system on the work discipline of civil servants at the Makassar City Manpower Office. Quantitative research emphasizes numerical measurement and statistical analysis to test hypotheses objectively and systematically. The explanatory approach was selected because the study aims to explain the causal relationship between the independent variable, namely the implementation of fingerprint attendance, and the dependent variable, namely employee work discipline. According to Waruwu (2023), explanatory quantitative research is appropriate for identifying and measuring causal relationships between variables through statistical procedures. Therefore, this research design is considered suitable for producing empirical evidence regarding the effectiveness of fingerprint attendance systems in improving employee discipline within public sector organizations.

3.2 Research Context and Setting

The research was conducted at the Makassar City Manpower Office, located at Jalan AP Pettarani No. 72, Banta-Bantaeng, Rappocini District, Makassar City, Indonesia. The institution was selected because it has implemented a fingerprint attendance system as part of its efforts to improve employee attendance discipline and organizational accountability. Despite the implementation of the biometric attendance system, several disciplinary issues such as lateness and absenteeism without explanation were still identified during the 2024 period. This context provides a relevant setting for evaluating the effectiveness of fingerprint attendance implementation in enhancing employee work discipline. The research was conducted over a period of approximately two months, from

3.3 Population and Sample / Research Participants

The population of this study consisted of all civil servants employed at the Makassar City Manpower Office, totaling 57 employees. According to Susanto et al. (2024), a population refers to all individuals or objects possessing characteristics relevant to the research problem. Since the total population was relatively small and manageable, this study employed a saturated sampling technique, in which all members of the population were included as research respondents. Thus, the sample size in this study consisted of 57 civil servants. The use of saturated sampling ensured comprehensive representation of the research population and minimized sampling bias.

3.4 Data Sources and Data Collection

This study utilized both primary and secondary data sources. Primary data were obtained directly from respondents through structured questionnaires distributed to civil servants at the Makassar City Manpower Office. The questionnaires were designed to collect information regarding employee perceptions of the fingerprint attendance system and their level of work discipline.

Secondary data were collected from institutional documentation, attendance records, books, scientific journals, and other relevant literature related to fingerprint attendance systems and employee discipline. The use of secondary data supported the theoretical foundation and contextual understanding of the study.

The data collection techniques employed in this research included:

a. Observation

Observation was conducted to directly examine employee attendance practices and organizational conditions related to the implementation of the fingerprint attendance system.

b. Questionnaire

A structured questionnaire using a Likert scale was distributed to respondents to measure perceptions regarding the implementation of fingerprint attendance and employee work discipline.

c. Documentation

Documentation techniques were used to obtain supporting data, including employee attendance reports, institutional records, and related administrative documents.

These data collection procedures were conducted systematically to ensure the accuracy, consistency, and reliability of the collected data.

3.5 Measurement of Variables and Research Instruments

This study consisted of two main variables, namely the independent variable and the dependent variable.

a. Independent Variable (X): Fingerprint Attendance System Implementation

The independent variable in this study was the implementation of the fingerprint attendance system. Fingerprint attendance refers to a biometric-based attendance system used to record employee attendance accurately through fingerprint

verification. The system aims to improve attendance monitoring, reduce manipulation, and enhance employee accountability.

The indicators of fingerprint attendance implementation were adapted from previous studies and included:

- 1) Accuracy of attendance recording
- 2) Ease of system use
- 3) Attendance monitoring effectiveness
- 4) Prevention of attendance fraud
- 5) Efficiency of attendance management
- 6) Security and reliability of attendance data

b. Dependent Variable (Y): Work Discipline

The dependent variable in this study was employee work discipline. Work discipline refers to employee awareness and willingness to comply with organizational rules, procedures, and working hours. Indicators of work discipline included:

- 1) Compliance with attendance schedules
- 2) Punctuality in arriving at work
- 3) Obedience to organizational regulations
- 4) Responsibility in completing work tasks
- 5) Compliance with workplace procedures

The research instrument used in this study was a structured questionnaire measured using a five-point Likert scale. The measurement scale was designed as follows:

Table 2. The Measurement Scale

No	Response Category	Score
1	Strongly Agree	5
2	Agree	4
3	Neutral	3
4	Disagree	2
5	Strongly Disagree	1

The questionnaire items were adapted from relevant previous studies to ensure construct validity and consistency with prior literature.

3.6 Data Analysis Techniques

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. The analytical procedures employed in this study included descriptive statistical analysis, validity testing, reliability testing, simple linear regression analysis, hypothesis testing, and coefficient of determination analysis.

a. Descriptive Statistical Analysis

Descriptive analysis was used to describe respondent characteristics and summarize

research variables through frequencies, percentages, means, and score distributions.

b. Validity Test

The validity test was conducted to determine whether the questionnaire items accurately measured the intended variables. An item was considered valid if the calculated correlation coefficient (r -count) was greater than the r -table value and the significance level was below 0.05 (Kamal, 2020).

c. Reliability Test

Reliability testing was performed using Cronbach's Alpha coefficient to assess the internal consistency of the research instrument. According to Maulidya et al. (2021), a variable is considered reliable if the Cronbach's Alpha value exceeds 0.60.

d. Simple Linear Regression Analysis

Simple linear regression analysis was employed to examine the effect of fingerprint attendance implementation on employee work discipline. The regression equation used in this study was:

$$Y = a + bX$$

Where:

Y = Employee Work Discipline

X = Fingerprint Attendance System Implementation

a = Constant (Y When $X = 0$)

b = Coefficient Regression (Shows size influence of X and Y)

e. Hypothesis Testing (t-test)

The t-test was used to determine whether the independent variable significantly affected the dependent variable. The hypothesis was accepted if the calculated t-value exceeded the t-table value and the significance value was less than 0.05.

f. Coefficient of Determination (R^2)

The coefficient of determination analysis was used to measure the proportion of variance in employee work discipline explained by the implementation of the fingerprint attendance system.

3.7 Validity, Reliability, and Trustworthiness

To ensure the quality and credibility of the research findings, validity and reliability testing procedures were conducted. The validity test ensured that each questionnaire item accurately measured the intended construct, while the reliability test evaluated the consistency and stability

of the instrument using Cronbach's Alpha coefficients.

The use of standardized questionnaire instruments, systematic data collection procedures, and statistical analysis through SPSS enhanced the methodological rigor and trustworthiness of the study. Furthermore, all respondents received the same questionnaire items and measurement procedures to maintain consistency in data collection.

3.8 Ethical Considerations

This study adhered to ethical research principles throughout the research process. Respondents participated voluntarily and were informed about the purpose and objectives of the study before completing the questionnaire. Informed consent was obtained from all participants, and confidentiality of respondent information was maintained. The collected data were used solely for academic purposes and were analyzed anonymously to protect respondent privacy and organizational integrity.

3.9 Research Procedure

The research procedure in this study was conducted systematically through several stages:

- Identifying research problems related to employee discipline and fingerprint attendance implementation.
- Conducting literature reviews and developing theoretical foundations.
- Formulating research hypotheses and research instruments.
- Determining the research population and sampling technique.
- Collecting primary and secondary data through questionnaires, observations, and documentation.
- Testing the validity and reliability of research instruments.
- Processing and analyzing data using SPSS version 27.
- Interpreting research findings and discussing the results.
- Drawing conclusions and providing recommendations for future improvements and research.

These procedures were designed to ensure methodological transparency and facilitate future

research replication.

3.10 Methodological Limitations

This study has several methodological limitations. First, the research was limited to one government institution, namely the Makassar City Manpower Office, which may limit the generalizability of the findings to other organizations or sectors. Second, the study only examined one independent variable, namely the implementation of fingerprint attendance systems, whereas other factors such as work motivation, leadership, organizational culture, supervision, and reward systems may also influence employee work discipline. Third, the use of self-reported questionnaires may introduce response bias due to subjective perceptions of respondents. Therefore, future studies are encouraged to include additional variables, broader research settings, and mixed-method approaches to provide more comprehensive findings regarding employee discipline in public sector organizations.

4. Results and Discussion

4.1 Research Results

4.1.1 Sample Description and Descriptive Statistics

Descriptive statistical analysis was conducted to provide a comprehensive overview of the characteristics of the research respondents and the distribution of research data. The respondent profiles in this study were classified based on age, gender, and educational level. In addition, descriptive analysis was also performed on the research variables, namely fingerprint attendance implementation and employee work discipline.

a. Respondent Characteristics Based on Age

Table 3. Characteristics of Respondents Based on Age

No	Age Range	Frequency	Percentage
1	22–29 Years	1	2%
2	30–39 Years	22	39%
3	40–49 Years	27	47%
4	50–59 Years	7	12%
Total		57	100%

Source: Primary data processed, 2025

Based on Table 3, the majority of respondents were between 40–49 years old, accounting for 27 respondents (47%). Respondents aged 30–39 years totaled 22 individuals (39%), while

respondents aged 50–59 years consisted of 7 individuals (12%). Only 1 respondent (2%) was in the 22–29 years age category. These findings indicate that most employees involved in this study were within the productive and mature working-age category.

b. Respondent Characteristics Based on Gender

Table 4. Characteristics of Respondents Based on Gender

No	Gender	Frequency	Percentage
1	Male	23	40%
2	Female	34	60%
Total		57	100%

Source: Primary data processed, 2025

Table 4. shows that female respondents dominated the study, with 34 respondents (60%), while male respondents accounted for 23 individuals (40%). These findings indicate that female employees constituted the majority of civil servants at the Makassar City Manpower Office who participated in this research.

c. Respondent Characteristics Based on Educational Level

Table 5. Characteristics of Respondents Based on Educational Level

No	Educational	Frequency	Percentage
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Level			
1	Senior High School	0	0%
2	Diploma (D3)	1	2%
3	Bachelor's Degree (S1)	42	74%
4	Master's Degree (S2)	14	25%
Total		57	100%

Source: Primary data processed, 2025

Based on Table 5, most respondents possessed a Bachelor's degree (S1), totaling 42 respondents (74%). Meanwhile, 14 respondents (25%) held a Master's degree (S2), and 1 respondent (2%) held a Diploma degree (D3). The findings indicate that the respondents generally had relatively high educational qualifications.

d. Descriptive Analysis of Research Variables

Descriptive analysis of the research variables was conducted to identify the distribution pattern of respondent responses regarding the implementation of fingerprint attendance systems and employee work discipline. The analysis focused on the mean score, frequency distribution, and respondent perceptions of each indicator.

1) Descriptive Analysis of Fingerprint Attendance Variable (X)

Table 6. Descriptive Analysis of Fingerprint Attendance Variable

No	Item	SS (5)	S (4)	KS (3)	TS (2)	STS (1)	Total Score	Mean
1	X1	20 (35%)	37 (65%)	0	0	0	248	4.35
2	X2	19 (33%)	38 (67%)	0	0	0	247	4.33
3	X3	20 (35%)	37 (65%)	0	0	0	248	4.35
4	X4	26 (46%)	31 (54%)	0	0	0	254	4.46
5	X5	19 (33%)	38 (67%)	0	0	0	247	4.33
6	X6	18 (32%)	39 (68%)	0	0	0	246	4.32

Source: IBM SPSS Statistics 27, 2025

Table 6. demonstrates that the highest mean value was obtained for item X4, namely "I do not experience technical difficulties in using the fingerprint attendance system every day," with a mean score of 4.46. This result indicates that respondents perceived the fingerprint attendance system as technically convenient and easy to use. Meanwhile, the lowest mean score was found for item X6, namely "The fingerprint attendance system ensures that only the concerned employee can check in," with a mean value of 4.32. Although this

score remained relatively high, it suggests that respondents perceived the security aspect of the system slightly lower compared to other indicators. Overall, the results indicate that employees positively perceived the implementation of the fingerprint attendance system.

4.1.2 Data Quality and Preliminary Analysis

a. Validity Test

The validity test was conducted to evaluate whether the questionnaire items accurately

measured the intended research variables. The validity criterion used in this study was that the calculated correlation coefficient (r -count) must exceed the r -table value and the significance level must be below 0.05.

The results indicated that all questionnaire items for both fingerprint attendance implementation and employee work discipline

Table 7. Reliability Test Results

Variable	Cronbach's Alpha	Criteria	Conclusion
Fingerprint Attendance Implementation	> 0.60	Reliable	Reliable
Work Discipline	> 0.60	Reliable	Reliable

Source: IBM SPSS Statistics 27, 2025

The reliability test results showed that all variables had Cronbach's Alpha values greater than 0.60, indicating that the research instruments were reliable and internally consistent.

4.1.3 Main Analytical Results

a. Simple Linear Regression Analysis

Simple linear regression analysis was employed to examine the effect of fingerprint attendance implementation on employee work discipline at the Makassar City Manpower Office. The regression equation obtained from the analysis was:

$$Y = 22.088 + 0.868X$$

Where:

Y= Employee Work Discipline

X= Fingerprint Attendance Implementation

The regression coefficient value of 0.868 indicates that every one-unit increase in the implementation of the fingerprint attendance system was followed by an increase of 0.868 units in employee work discipline.

4.1.4 Hypothesis Testing Results

a. Partial Test (t-test)

Table 8. t-Test Results

Variable	t-count	t-table	Significance	Conclusion
Fingerprint Attendance Implementation	6.767	1.673	0.000	Significant

Source: IBM SPSS Statistics 27, 2025

The t-test results demonstrated that the calculated t-value (6.767) was greater than the t-table value (1.673), with a significance value of 0.000, which was lower than 0.05. Therefore, the hypothesis stating that fingerprint attendance implementation positively and significantly affects employee work discipline was accepted.

b. Coefficient of Determination (R^2)

Table 9. Coefficient of Determination Results

R	R Square (R^2)	Adjusted R Square
0.674	0.454	0.444

Source: IBM SPSS Statistics 27, 2025

The coefficient of determination (R^2) value of 0.454 indicates that 45.4% of the variation in employee work discipline could be explained by the implementation of the fingerprint attendance system, while the remaining 54.6% was influenced by other variables not examined in this study.

variables met the validity requirements. Therefore, all indicators used in the research instrument were declared valid and suitable for further analysis.

b. Reliability Test

Reliability testing was conducted using Cronbach's Alpha to measure the consistency and stability of the questionnaire items.

4.2 Research Discussion

4.2.1 Interpretation of Key Findings

The findings of this study demonstrate that the implementation of the fingerprint attendance system has a positive and significant effect on the work discipline of civil servants at the Makassar City Manpower Office. The regression coefficient value of 0.868 indicates that improvements in the implementation of the fingerprint attendance system contribute positively to increased employee discipline. Furthermore, the t-test results confirmed that the effect was statistically significant, as indicated by the calculated t-value of 6.767, which exceeded the t-table value of 1.673, with a significance level of $0.000 < 0.05$.

These findings suggest that the fingerprint attendance system effectively functions as a monitoring and control mechanism that encourages employees to comply with attendance regulations and working hours. The biometric system reduces

opportunities for attendance manipulation and increases employee accountability because attendance verification must be conducted directly using individual fingerprints.

4.2.2 Comparison with Previous Studies

The results of this study are consistent with prior empirical findings regarding the effectiveness of biometric attendance systems in improving employee discipline. Kamal et al. (2020) found that fingerprint attendance systems significantly improved employee discipline at the Ministry of Communication and Informatics in Jakarta, with a strong correlation coefficient of 0.773. Similarly, Fadila and Septiana (2019) reported that the implementation of fingerprint attendance systems positively influenced employee discipline at the Batam Business Agency.

The findings are also aligned with studies conducted by Maulidya et al. (2021), Azizah et al. (2022), and Kurniawan and Usuluddin (2021), which concluded that fingerprint attendance systems contribute positively to work discipline and employee compliance with organizational regulations.

However, this study differs from the findings of Malombeke et al. (2024), who reported that biometric attendance implementation did not significantly affect employee work discipline at Fellow Coffee. Such differences may arise from variations in organizational characteristics, employee behavior, work environments, and analytical approaches used in the studies. Unlike the present study, which focused specifically on fingerprint attendance implementation using simple linear regression analysis, Malombeke et al. (2024) incorporated additional variables such as motivation and job satisfaction within a multiple regression framework.

4.2.3 Theoretical Contributions

This study contributes to the development of human resource management theory, particularly regarding employee discipline and organizational control systems. The findings support the perspective that technological control mechanisms, such as biometric attendance systems, can strengthen organizational discipline and employee compliance.

The study also reinforces the theoretical assumption that effective monitoring systems improve employee accountability and reduce disciplinary violations. In addition, this research extends prior literature by providing empirical evidence from the public sector context, particularly within local government institutions in Indonesia. Thus, the study enriches the discussion regarding the role of digital attendance systems in improving organizational performance and discipline management.

4.2.4 Practical and Policy Implications

Practically, the findings suggest that government institutions and public organizations should optimize the implementation of fingerprint attendance systems to improve employee discipline and organizational efficiency. The system can be utilized not only as an attendance recording mechanism but also as a strategic management tool for monitoring employee compliance and improving accountability.

The Makassar City Manpower Office is encouraged to strengthen the effectiveness of the attendance system by integrating additional disciplinary policies, such as stricter supervision, periodic evaluations, incentive systems for disciplined employees, and sanctions for attendance violations. Furthermore, upgrading biometric attendance technology through facial recognition or integrated digital systems may improve operational efficiency and security.

For policymakers, the study provides evidence that digital attendance systems can support bureaucratic reform and public sector governance by enhancing transparency, accountability, and employee discipline.

4.2.5 Integration with the Research Gap

This study addresses the research gap identified in previous literature concerning the inconsistent findings regarding the effectiveness of fingerprint attendance systems in improving employee discipline, particularly in public sector institutions. While several prior studies focused on private organizations or combined fingerprint attendance with other variables, this research specifically examined the direct effect of fingerprint attendance implementation on employee work discipline within a government institution.

The findings provide empirical evidence that biometric attendance systems significantly influence employee discipline in the public sector context. Therefore, the study contributes to expanding the literature on digital human resource management practices and employee behavioral control within governmental organizations.

4.2.6 Acknowledgement of Study Limitations

Although this study provides important findings, several limitations should be acknowledged. The findings are context-specific to the Makassar City Manpower Office and may not fully represent other government institutions or organizational sectors with different work cultures and management systems.

In addition, employee work discipline may also be influenced by other organizational and psychological factors not included in this study, such as leadership style, work motivation, organizational culture, reward systems, and job satisfaction. Consequently, future studies are encouraged to incorporate additional variables and broader organizational contexts to provide more comprehensive insights into employee discipline and attendance management systems.

5. Conclusion

5.1 Summary of Key Findings

This study aimed to examine the effect of the implementation of a fingerprint attendance system on the work discipline of civil servants at the Makassar City Manpower Office. The findings revealed that the implementation of the fingerprint attendance system had a positive and significant effect on employee work discipline. The results indicate that biometric attendance systems can effectively improve employee compliance with attendance regulations, punctuality, and organizational discipline.

The descriptive findings also demonstrated that employees generally perceived the fingerprint attendance system positively, particularly regarding ease of use, efficiency, and attendance monitoring. Furthermore, the coefficient of determination analysis showed that the implementation of the fingerprint attendance system contributed substantially to explaining variations in employee work discipline, although other factors outside the study also influenced disciplinary behavior.

Overall, the study confirms that the use of digital biometric attendance systems can strengthen organizational control mechanisms and support discipline improvement within public sector institutions.

5.2 Theoretical Contributions

This study contributes to the development of human resource management literature, particularly regarding employee discipline and technology-based organizational control systems. The findings support the theoretical perspective that monitoring and control technologies, such as biometric attendance systems, can enhance employee accountability and organizational compliance.

In addition, this research extends prior studies by providing empirical evidence from the context of public sector organizations, specifically local government institutions in Indonesia. Previous studies have predominantly focused on private organizations or combined fingerprint attendance systems with other organizational variables. Therefore, this study enriches the existing literature by specifically examining the direct relationship between fingerprint attendance implementation and employee work discipline within a governmental environment.

The study also contributes to addressing inconsistencies in previous empirical findings regarding the effectiveness of biometric attendance systems. By confirming the positive relationship between fingerprint attendance implementation and employee discipline, this research strengthens the understanding of how digital human resource management systems influence employee behavior and organizational effectiveness.

5.3 Practical and Policy Implications

The findings of this study provide several practical implications for organizational managers and policymakers, particularly within government institutions. The results suggest that fingerprint attendance systems can be utilized as an effective managerial tool to improve employee discipline, attendance monitoring, and organizational accountability.

For the Makassar City Manpower Office, the study highlights the importance of optimizing attendance monitoring systems through continuous evaluation and technological improvement. The

institution is encouraged to strengthen disciplinary policies by integrating stricter supervision, periodic attendance evaluations, reward systems for disciplined employees, and sanctions for violations of attendance regulations.

In addition, policymakers in the public sector may consider expanding the implementation of biometric attendance systems as part of broader bureaucratic reform initiatives aimed at improving transparency, efficiency, and public service quality. The integration of more advanced attendance technologies, such as facial recognition systems and digital attendance monitoring platforms, may further improve organizational effectiveness and employee accountability.

5.4 Limitations of the Study

Despite providing important empirical findings, this study has several limitations that should be acknowledged. First, the study was conducted only at the Makassar City Manpower Office, which limits the generalizability of the findings to other public institutions or private organizations with different organizational cultures and management systems.

Second, the study focused solely on the implementation of fingerprint attendance systems as the independent variable affecting employee work discipline. Other potentially influential factors, such as leadership style, work motivation, organizational culture, reward systems, job satisfaction, and supervision mechanisms, were not included in the analysis. As a result, the findings may not fully explain all determinants of employee discipline.

Third, the study relied on questionnaire-based responses, which may be subject to respondent bias or subjective perceptions. Consequently, the interpretation of the findings should consider the contextual and perceptual nature of the collected data.

5.5 Directions for Future Research

Future research is recommended to expand the scope of analysis by involving broader organizational settings, including other government agencies, private sector organizations, and institutions with different administrative systems. Comparative studies across sectors or regions may provide deeper insights into the effectiveness of

biometric attendance systems in diverse organizational environments.

Future studies are also encouraged to incorporate additional variables that may influence employee work discipline, such as leadership, organizational culture, employee motivation, job satisfaction, supervision systems, and reward mechanisms. Including these variables may provide a more comprehensive understanding of employee disciplinary behavior.

Moreover, future researchers may apply alternative methodological approaches, such as mixed methods or longitudinal studies, to obtain richer and more in-depth findings regarding the long-term effectiveness of digital attendance systems. The use of advanced analytical methods, including structural equation modeling (SEM) or qualitative approaches, may also contribute to a deeper exploration of the relationships between technological systems, employee behavior, and organizational performance.

6. References

- Afriani, D., & Maliah, M. (2021). The Effect of Fingerprint Attendance and Supervision on Employee Work Discipline at JNE Palembang. *Jurnal Media Wahana Ekonomika*.
- Agustini, F. (2019). Human resource management strategy. Alexandra, R., Ahmad, L., & Imilda. (2024). Analysis of the Effect of Fingerprint Attendance on Discipline, Motivation, and Performance of Employees of the Aceh Public Works and Spatial Planning Service (Pupr Aceh) Using the Tam Method. *Computer Systems Journal (SISKOM)*, 89-90.
- Azizah, SN, Permatasari, B., & Suwarni, E. (2022). The Effect of Fingerprint Attendance Implementation on the Work Discipline of State Civil Apparatus in the Goods/Services Procurement Section of the Bandar Lampung City Secretariat. *Journal Strategy of Management and Accounting Through Research and Technology (SMART)*, 69-70.
- Cahyani, FN, & Rokhman, N. (2021). The Influence of Leadership and Fingerprint Absenteeism on Employee Work Productivity at PT. Komitrando Gunungkidul with Work

- Discipline as a Moderating Variable. *Cakrawangsa Bisnis: Student Scientific Journal*, 234.
- Decaprio, L., Novalia, N., & Puspita, S. (2023). The Effect of Fingerprint Attendance on Employee Performance at the Regional Tax Management Agency (BPPD) of Palembang City. *Journal of Management and Investment (MANIVESTASI)*, 86.
- Fadila, R., & Septiana, M. (2019). The Effect Of The Implementation Of The Fingerprint Absence System On Employee Discipline At The Headquarters Of The Security Directorate Of The Batam Business Agency. *Journal of Applied Business Administration*.
- Gifelem, K., Mangantar, M., & Uhing, Y. (2022). Analysis of the effectiveness of implementing a fingerprint attendance model in improving work discipline among civil servants at the Sorong Regency Regional Secretariat. *Emba Journal: Journal of Economic, Management, Business, and Accounting Research*.
- Kamal, F., Winarso, W., & Hidayat, WW (2020). The Effect of Fingerprint Attendance on Improving Employee Work Discipline at the Ministry of Communication and Informatics. *Scientific Journal of Accounting and Management*, 32.
- Kemalasari, AD, Agustina, H., & Zulkarnaen, I. (2019). The Influence of the Effectiveness of Fingerprint Attendance Implementation on Civil Servant Work Discipline at the Cirebon City Environmental Service. *Jurnal Ilmiah Publika*.
- Kurniawan, A., & Usuluddin, L. (2021). The effect of fingerprint attendance on work discipline of employees at the Palembang health training center. *Journal of Trends Economics and Accounting Research*.
- Malombeke, DA, Nelwan, OS, & Pondaag, JJ (2024). The Influence of the Effectiveness of Biometric Attendance (Fingerprint) Implementation, Motivation, and Job Satisfaction on Employee Work Discipline at Fellow Coffee. *EMBA Journal: Journal of Economics, Management, Business and Accounting Research*, 12(01).
- Maulidya, NP, Larassaty, AL, & Pujiyanto, WE (2021). The Effect of Fingerprint Attendance Implementation, Sanctions, and Motivation on Employee Work Discipline at Intako. *Greenomika*, 88-89.
- Mayamin, & Lasmiana. (2023). The Effect of Fingerprint Attendance on Employee Work Discipline. *Research and E-Journal of Computer Informatics Management*, 602.
- Muna, N., & Isnowati, S. (2022). The Effect of Work Discipline, Work Motivation, and Career Development on Employee Performance (Study at PT LKM Demak Sejahtera). *Journal of Economics & Sharia Economics*, 1121-1122.
- Oktafiana, W., Riono, SB, Syaifulloh, M., & Kristiana, A. (2020). The Influence of the Effectiveness of Fingerprint Attendance Implementation at the Regional Revenue, Finance, and Asset Management Agency (Bppkad) of Brebes Regency. *Journal of Economics and Management (JECMA)*.
- Puspaningrum, D., Adji, S., & Kristiyana, N. (2019). The Effect of Fingerprint Attendance System Implementation, Work Motivation, and Leadership on Employee Work Discipline. *ISOQUANT: Journal of Economics, Management, and Accounting*.
- Rahmawati, SR, & Purwadhi. (2020). The Effectiveness of Fingerprint Attendance and Incentive Implementation on Employee Discipline at FPOK UPI. *Service Management Triangle: Journal of Service Management*.
- Sanjaya, V., & Febrian, WD (2024). The influence of work discipline, non-physical work environment, and authoritarian leadership style on employee performance (Case Study of Cardig International Group Employee Cooperative). *Journal of Management and*

Saputri, R., Veronica, M., & Yeni, Y. (2024). The Effect Of Fingerprint And Sanctions Implementation On Work Discipline Of Employees Of The Palembang Culture Service. *Community Development Journal: Journal of Community Service*.

Susanto, PC, Arini, DU, Yuntina, L., Soehaditama, JP, & Nuraeni. (2024). Quantitative Research Concepts: Population, Sample, and Data Analysis (A Literature Review). *Multidisciplinary Journal of Science*.

Syarifudin, Sabri, Erna, Ramadhan, M., & Dini, R. (2024). The Effect of Fingerprint Attendance Implementation and Work Motivation on Employee Work Discipline at MAN 3 Bener Meriah, Bener Meriah Regency. *Creative Management Journal*.

Waruwu, M. (2023). Educational Research Approaches: Qualitative Research Methods, Quantitative Research Methods, and Mixed Methods. *Tambusai Education Journal*, 2902-2910