

The Role of Employee Engagement in Mediating the Adoption of HR Technology on Employee Performance

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Abstract

This study aims to analyze the role of employee engagement in mediating the effect of human resource technology adoption on employee performance at the Human Resources Bureau of the North Sumatra Regional Police. The development of digital technology in human resource management requires organizations not only to provide technological systems but also to ensure that employees can accept, use, and utilize these technologies optimally. In this study, employee engagement is positioned as an intervening variable that explains the mechanism of the relationship between HR technology adoption and improved employee performance. This study employs a quantitative approach with a population and sample of 115 employees from the Human Resources Bureau of the North Sumatra Regional Police, selected through saturation sampling. Data collection was conducted using a questionnaire with a Likert scale, while data analysis utilized the Partial Least Squares Structural Equation Modeling (PLS-SEM) method with the assistance of the SmartPLS software. Model testing was conducted through an outer model evaluation to assess the validity and reliability of the instruments, as well as an inner model evaluation to test the relationships among the research variables. The results indicate that HR technology adoption has a positive and significant effect on employee engagement, with a path coefficient of 0.419, a t-statistic of 7.239, and a p-value of 0.000. HR technology adoption also has a positive and significant effect on employee performance, with a path coefficient of 0.177, a t-statistic of 2.774, and a p-value of 0.006. Furthermore, employee engagement has a positive and significant effect on employee performance, with a path coefficient of 0.599, a t-statistic of 10.331, and a p-value of 0.000. The results of the indirect effect test indicate that HR technology adoption has a positive and significant effect on employee performance through employee engagement, with a coefficient of 0.251, a t-statistic of 5.617, and a p-value of 0.000.

Keywords: Technology Adoption in HR, Employee Engagement, Employee Performance

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Introduction

Employee performance is one of the key factors determining an organization's success in achieving its strategic goals, in both the public and private sectors. Performance not only reflects the work outcomes achieved by employees but also reflects the organization's ability to manage human resources effectively. Organizations with high-performing employees are better able to improve productivity, service quality, operational effectiveness, and the achievement of organizational goals. Therefore, improving employee performance has become a key focus in modern human resource management.

Advances in digital technology have brought about significant changes in human resource management practices. Organizations are now adopting various HR technologies, or Human Resource Information Systems (HRIS), to support administrative processes, employee data management, recruitment, competency development, performance evaluations, and employee services. The adoption of HR technology is no longer viewed merely as the use of software, but as a process involving how technology is accepted, used, and optimally leveraged to support employees' work activities. The effective implementation of HR technology is believed to enhance the efficiency of work processes, reduce administrative errors, accelerate access to information, and support data-driven decision-making.

In public organizations, digital transformation in HR management is becoming increasingly important as demands for fast, accurate, transparent, and accountable services continue to rise. The use of HR technology enables organizations to build a more integrated work system that is responsive to the needs of both employees and the organization. However, the success of HR technology implementation is determined not only by the availability of the technology system but also by the extent to which employees accept and use the technology in their daily work activities. Technology that is not used optimally by employees will struggle to have an impact on improving organizational performance.

One factor that plays a crucial role in the successful adoption of HR technology is employee engagement. Employee engagement describes a state in which employees have an emotional, cognitive, and behavioral connection to their work and the organization. Employees with high levels of engagement tend to demonstrate enthusiasm, commitment, a sense of responsibility, and a willingness to contribute their best to the organization. In the context of organizational digitalization, employee engagement is a critical factor because it determines how employees respond to change, accept new technologies, and utilize them to improve work effectiveness.

The relationship between HR technology adoption and employee performance is not always direct. The use of technology can improve performance if employees are highly engaged in the work process. When employees feel that the implemented technology provides benefits, simplifies their work, and is supported by the organization, they will be more motivated to actively use that technology. Conversely, if employees lack sufficient engagement, technology implementation may face obstacles such as low acceptance, limited usage, or reliance on outdated work procedures. Thus, employee engagement can serve as a mechanism that explains how HR technology adoption can lead to improved employee performance.

Several previous studies have shown that HR technology has a positive relationship with various organizational outcomes. The use of HRIS can improve work efficiency, the quality of HR services, and the organization's ability to manage employee information. Additionally, research on employee engagement indicates that highly engaged employees tend to perform better because they possess greater motivation and commitment to their work. However, most previous studies have primarily examined the direct effect of HR technology on performance or the effect of employee engagement on performance separately.

There remains a research gap regarding how employee engagement acts as a mediating variable in the relationship between HR technology adoption and employee performance. While some organizations have undergone digital transformation, few studies have elucidated the psychological and behavioral mechanisms through which such technology impacts

performance. Therefore, research is needed that integrates technology adoption, HR, employee engagement, and employee performance into a single research model.

The context of public organizations is particularly interesting to examine because the success of HR digitalization heavily depends on employees' readiness to accept changes in work systems. In organizations with high service demands, employees are not only expected to be able to use technology but also to demonstrate strong engagement so that the technology can be utilized to its fullest potential in supporting the achievement of organizational goals.

Based on this discussion, a study titled "The Role of Employee Engagement in Mediating the Effect of HR Technology Adoption on Employee Performance" is important to conduct. This study is expected to provide empirical insights into how HR technology adoption influences employee performance through employee engagement as an intervening variable, as well as to contribute to organizations in designing digital-based HR management strategies capable of enhancing the effectiveness and quality of employee performance.

Literature Review

Theoretical Framework

1. Employee Performance

a) Definition of Employee Performance

According to Armstrong (2021), performance is the result of the interaction between an individual's abilities, motivation, and work opportunities in achieving organizational goals. Thus, performance is not only related to the final outcome of work but also encompasses the work processes employees undertake to achieve predetermined targets. Consequently, employee performance in public organizations such as the North Sumatra Regional Police also reflects the level of success in carrying out service duties, enforcing the law, and maintaining public safety and order in accordance with applicable standards of professionalism.

b) Employee Performance Indicators

Employee performance indicators (Armstrong, 2021):

1) Work Quality

Work quality describes the level of accuracy, neatness, and conformity of an employee's work results to the standards set by the organization. The higher the quality of work produced, the greater the employee's contribution to achieving the organization's goals.

2) Quantity of Work

Work quantity indicates the amount of work an employee is able to complete within a specific time period in accordance with the targets set by the organization.

3) Timeliness

Timeliness describes an employee's ability to complete work by the deadlines set by the organization.

4) Effectiveness

Effectiveness describes an employee's ability to optimally utilize available resources to achieve the results expected by the organization.

5) Independence

Independence indicates an employee's ability to carry out their duties and responsibilities without relying heavily on instructions or assistance from others.

2. Employee Engagement

a) Definition of Employee Engagement

According to Qualtrics (2024), employee engagement is the level of commitment employees have to helping the organization achieve its goals, as reflected in how they think, feel, and act, as well as in their emotional connection to their work, their team, and the organization.

b) Employee Engagement Indicators

According to Qualtrics (2024), employee engagement is typically measured using the following indicators:

- 1) Engagement, which refers to the level of enthusiasm, commitment, and emotional attachment employees have toward their work and the organization, as reflected in their willingness to contribute more.
- 2) Inclusion, which refers to the extent to which employees feel valued, accepted, and treated fairly in a work environment free from discrimination.
- 3) Well-being, which refers to employees' physical, mental, and emotional condition that affects their comfort and ability to perform optimally at work.
- 4) Intent to Stay, which refers to employees' desire to remain with the organization for a certain period of time as a form of loyalty.
- 5) Experience vs. Expectations, which refers to the extent to which employees' perceived work experience meets or exceeds their expectations of the organization.

3. HR Technology Adoption

a) Definition of HR Technology Adoption

According to Ivanaj (2023), HR technology adoption, or HRIS adoption, is the process of initiating and implementing information technology to support HR professionals in carrying out their duties, and generally refers to the actual level of use of the system.

b) Indicators of HR Technology Adoption

According to Ivanaj (2023), the indicators of HR technology adoption are:

- 1) Actual Use of HR Technology
Indicates the extent to which employees actually use HR systems/technology in their daily work. Meta-analytic literature on HRIS identifies system usage as the primary form of adoption.
- 2) Frequency of Use
Indicates how often HR technology is used to support work activities. Frequency of usage is cited as one of the operational forms of HRIS adoption.
- 3) Technology acceptance
Indicates the extent to which employees accept the presence of HR technology as part of the work process. In the HRIS literature, acceptance is used as an important indicator of adoption.
- 4) Utilization of technology in HR tasks
Indicates the extent to which HR technology is truly integrated to assist in the performance of HR tasks, such as employee data management, administrative services, or other HR processes.

Conceptual Framework

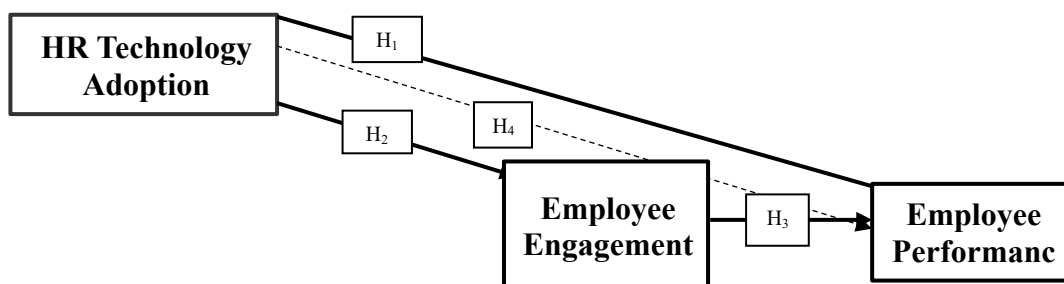


Figure 1. Conceptual Framework

Research Hypotheses

H₁: The adoption of HR technology has a positive and significant effect on employee engagement at the North Sumatra Regional Police HR Bureau.

- H₂: The adoption of HR technology has a positive and significant effect on employee performance at the North Sumatra Regional Police HR Bureau.
- H₃ : Employee engagement has a positive and significant effect on employee performance at the North Sumatra Regional Police Human Resources Bureau.
- H₄ : The adoption of HR technology has a positive and significant effect on employee performance through employee engagement at the North Sumatra Regional Police HR Bureau.

Research Methodology

Type of Research

The type of research used is quantitative research. According to Sugiyono (2022), quantitative research is defined as a method grounded in the philosophy of positivism, used to study a specific population or sample; sampling techniques are generally conducted randomly; data collection uses research instruments; and data analysis is quantitative/statistical in nature, with the aim of testing predetermined hypotheses. This quantitative research was conducted to examine the impact of HR technology adoption and digital competencies on employee performance, with employee engagement serving as an intervening variable, at the Human Resources Bureau of the North Sumatra Regional Police.

Research Location and Timeframe

The study was conducted at the North Sumatra Regional Police Headquarters, located at Jalan Sisingamangaraja Km. 10.5 No. 60, Timbang Deli, Medan Amplas District, Medan City. The study was conducted over a period of 3 months, from May to August 2026.

Population and Sample

According to Sugiyono (2025), the population consists of all objects or subjects possessing specific characteristics defined by the researcher for study, from which conclusions are subsequently drawn. Based on this definition, the population in this study comprises all employees of the Human Resources Bureau of the North Sumatra Regional Police, totaling 115 individuals.

The sample in this study consists of all employees at the Human Resources Bureau of the North Sumatra Regional Police, totaling 115 people. The sampling technique used is saturation sampling, which involves selecting the entire population as the research sample.

Research Data Sources

The data source used in this study is primary data.

Results

Outer Model Analysis

The *Outer Model* analysis, using the *PLS algorithm*, yielded the following results:

Validity Test

Table 1. Outer Loadings Values

	HR Technology Adoption	Employee Engagement	Employee Performance
X1.1	0.805		
X1.2	0.697		
X1.3	0.864		
X1.4	0.824		
Y.1			0.741
Y.2			0.861
Y.3			0.758
Y.4			0.882

	HR Technology Adoption	Employee Engagement	Employee Performance
Y.5			0.821
Z.1		0.783	
Z.2		0.734	
Z.3		0.873	
Z.4		0.855	
Z.5		0.884	

Source: Smart PLS Output, 2025

Based on the values in Table 1 above, the results of the outer model test using factor loadings/outer loadings show that all indicators for each variable have loadings ≥ 0.60 . This indicates that each indicator is measured validly. Therefore, it can be concluded that all items in the questionnaire meet the validity criteria, as shown in the following figure.

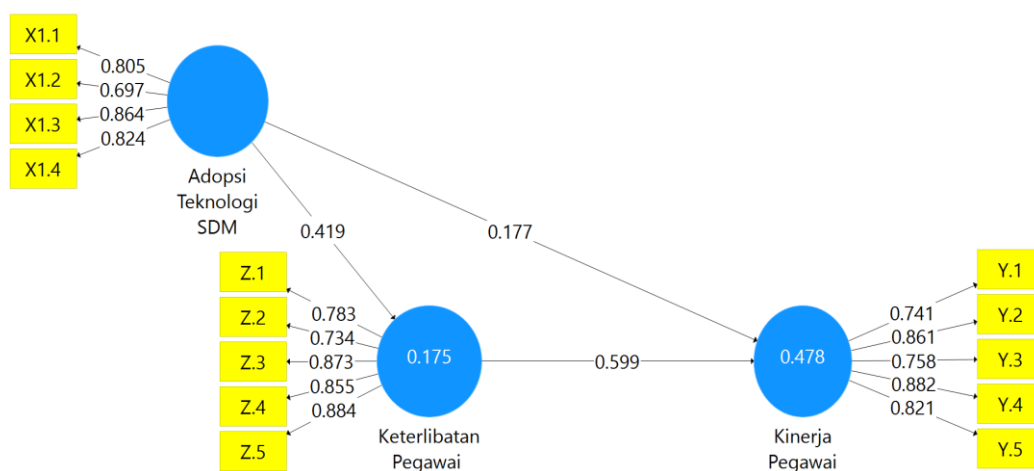


Figure 2. Outer Loadings

Reliability Test

Table 2. Construct Reliability and Validity Test

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
HR Technology Adoption	0.814	0.838	0.876	0.640
Employee Engagement	0.884	0.899	0.915	0.685
Employee Performance	0.872	0.883	0.907	0.663

Source: Smart PLS Output, 2025

From Table 2 above, the reliability test results show that the Cronbach's Alpha and Composite Reliability values for all constructs are above 0.70, and the AVE values are above 0.05. This indicates that all indicators have high internal consistency and are reliable for measuring their respective constructs. Therefore, the research instrument is deemed reliable and suitable for use in testing the structural model.

Coefficient of Determination (R^2)

When evaluating a model using PLS, the analysis begins by examining the R-squared value for each latent dependent variable. The table below presents the estimated R-squared values obtained using SmartPLS.

Table 3. R-Square Results

	R-Square	Adjusted R-Square
Employee Engagement	0.175	0.171

Employee Performance	0.478	0.473
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Source: Smart PLS, 2025

Table 3 shows the R-squared values for both dependent variables. For the employee engagement variable, the R-squared value is 0.175; this means that HR technology adoption accounts for 0.175, or 17.5%. The remainder is attributed to other variables outside the model. The R-squared value for employee performance is 0.478, meaning that the adoption of HR technology and employee engagement account for 0.478 or 47.8%; the remainder is attributed to other variables outside the model.

Structural Model Testing (Inner Model)

Hypothesis Testing

Direct Effects Between Variables

Direct effects between variables can be seen in the *path coefficient* values. The data analysis results show that the direct effect values are presented in the following table.

Table 4. *Path Coefficients* (Direct Effects)

	Original Sample	T Statistics	P-Values	Conclusion
HR Technology Adoption -> Employee Engagement	0.419	7.239	0.000	Accepted
HR Technology Adoption -> Employee Performance	0.177	2.774	0.006	Accepted
Employee Engagement -> Employee Performance	0.599	10.331	0.000	Accepted

Source: Smart PLS Output, 2025

Table 4 shows the following direct effect values:

1. The adoption of HR technology has a positive and significant effect on employee performance, with a t-statistic of 7.239 (above 1.96) and a p-value of 0.000 (below 0.05). This means that the adoption of HR technology has a real effect on employee performance because the significance level is below 0.05. These findings are consistent with previous research, which found that the adoption of HR technology has a positive and significant effect on employee performance (Mahmudah et al., 2024).
2. The adoption of HR technology has a positive and significant effect on employee engagement, with a t-statistic of 2.774 (above 1.96) and a p-value of 0.006 (below 0.05). This means that the adoption of HR technology has a significant effect on employee engagement because the p-value is below 0.05. These findings are consistent with previous research, which also found that the adoption of HR technology has a positive and significant effect on employee engagement (Nikmah et al., 2023).
3. Digital competence has a positive and significant effect on employee performance, with a t-statistic of 10.331 (above 1.96) and a p-value of 0.000 (below 0.05). This means that digital competence has a significant effect on employee performance because the p-value is below 0.05. These findings are consistent with previous research, which indicates that digital competence has a positive and significant effect on employee performance (Andriyani & Surya, 2026; Ferine, 2020; Rizaldi et al., 2026).

Indirect Effects Between Variables

The indirect effects between variables can be seen in the *specific indirect effects* values. The data analysis results show that the indirect effect values are presented in Table 5 below.

Table 5. *Specific Indirect Effects*

	Original Sample	T Statistics	P Values	Conclusion
HR Technology Adoption -> Employee Engagement -> Employee Performance	0.251	5.617	0.000	Accepted

Source: Smart PLS, 2025

Table 5 shows indirect effects between variables, namely: HR technology adoption has a positive and significant effect on employee performance through employee engagement, with a t-statistic of 5.617 (above 1.96) and a significance level of 0.000 (below 0.05). This means that employee engagement acts as an intervening variable between HR technology adoption and employee performance.

Conclusion

1. The adoption of HR technology has a positive and significant effect on employee engagement at the North Sumatra Regional Police HR Bureau.
2. HR technology adoption has a positive and significant effect on employee performance at the North Sumatra Regional Police HR Bureau.
3. Employee engagement has a positive and significant effect on employee performance at the North Sumatra Regional Police Human Resources Bureau.
4. The adoption of HR technology has a positive and significant effect on employee performance through employee engagement at the North Sumatra Regional Police HR Bureau.

Recommendations

Based on the results of this study on the influence of HR technology adoption and digital competencies on employee performance, with employee engagement as an intervening variable, at the North Sumatra Regional Police HR Bureau, the following recommendations can be made:

1. **Recommendations Regarding HR Technology Adoption**
The North Sumatra Regional Police Human Resources Bureau is advised to continue optimizing the use of HR technology to support employees' work activities. This can be achieved by increasing the frequency of digital system use, ensuring all employees utilize HR technology to complete their tasks, and conducting periodic evaluations of the effectiveness of the systems in use. In addition, the organization needs to ensure that the HR technology implemented is user-friendly, aligned with job requirements, and capable of streamlining administrative processes and personnel services. With improved adoption of HR technology, employees will find it easier to perform their duties effectively, thereby supporting improved performance.
2. **Recommendations Regarding Employee Engagement**
The Human Resources Bureau of the North Sumatra Regional Police is advised to increase employee engagement by creating a work environment that fosters a sense of belonging, appreciation, and comfort at work. These efforts can be achieved by improving communication between leadership and employees, providing employees with opportunities to offer feedback on technology use and work processes, and fostering an organizational culture that values employee contributions. High levels of employee engagement will foster greater commitment, enthusiasm, and accountability, which will lead to improved performance.
3. **Recommendations Regarding Employee Performance**
The Human Resources Bureau of the North Sumatra Regional Police is advised to maintain and improve employee performance by enhancing the quality and quantity of work, timeliness, effectiveness, and employee autonomy. Performance can be improved by setting clear work targets, conducting regular performance evaluations, providing digital work tools, and offering opportunities for employee skill development. The organization also needs to ensure that the implementation of technology and the improvement of digital competencies are truly aimed at supporting faster, more accurate, and higher-quality work completion.
4. **Suggestions for Future Researchers**

Further research is recommended to develop the research model by adding other variables that may potentially influence employee performance and employee engagement, given that there are still other factors outside the scope of this study that have not yet been examined. Variables that could be considered include digital leadership, organizational culture, organizational support, work motivation, readiness for change, job satisfaction, and technostress.

In addition, future research could expand the scope of the study to include other work units within the North Sumatra Regional Police and other public agencies so that the research findings have a broader scope of generalizability. Future research could also employ a longitudinal approach or a mixed-methods design—combining surveys and interviews—to gain a deeper understanding of the process of HR technology adoption, the development of digital competencies, and the factors influencing employee engagement and performance.

Future researchers may also examine moderating variables such as age, length of service, educational level, digital readiness, or managerial support to identify factors that may strengthen or weaken the relationship between HR technology adoption, digital competencies, employee engagement, and employee performance.

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