The Influence of Digital Leadership on Employee Performance at the Food Security and Agriculture Office of Binjai City

Florentina Boangmanalu, Kiki Farida Ferine

Abstract

This study investigates the influence of digital leadership on employee performance at the Food Security and Agriculture Office of Binjai City. The research adopts a quantitative causal-associative design to analyze the relationship between digital leadership as the independent variable and employee performance as the dependent variable. The study was conducted from September to December 2025 with a saturated sample of 40 employees. Data were collected using structured questionnaires and analyzed with SPSS version 25.0 through descriptive statistics, validity and reliability testing, regression analysis, and hypothesis testing. The descriptive results showed that both digital leadership (M = 4.45, SD = 0.49) and employee performance (M = 4.37, SD = 0.44) were rated above average, reflecting favorable employee perceptions. Regression analysis confirmed a significant positive effect of digital leadership on employee performance, with digital leadership explaining 58.5% of performance variance. Hypothesis testing indicated that every one-point increase in digital leadership contributes to a 1.197-point improvement in employee performance.The findings underscored the importance of digital leadership in enhancing productivity, efficiency, and engagement in the public sector. Practical implications include the need for capacity-building programs to strengthen leadership competencies and the alignment of employee development with digital strategies. Future studies are recommended to explore additional factors such as organizational culture and technological readiness to broaden the model.

Keywords: Digital Leadership, Employee Performance, Organizational Transformation

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Introduction

The rapid development of digital technology has reshaped organizational dynamics across both private and public institutions. Leadership in the digital era is no longer limited to traditional managerial roles; it requires the ability to integrate technology into decision-making, communication, and performance improvement. Previous studies indicate that digital leadership has a direct and positive effect on employee performance [1]. Furthermore, digital leadership strengthens organizational adaptability and innovation capacity [2];[3].

However, research in this area has primarily focused on private organizations with high levels of digital maturity. In contrast, government institutions often face challenges such as limited resources, bureaucratic rigidity, and resistance to change. Preliminary observations at the Food Security and Agriculture Office of Binjai City reveal similar barriers, highlighting the urgency of exploring digital leadership in the public sector.

This study aims to fill this gap by examining the impact of digital leadership on employee performance within a local government context. It contributes to both theoretical understanding and practical applications for public service organizations undergoing digital transformation
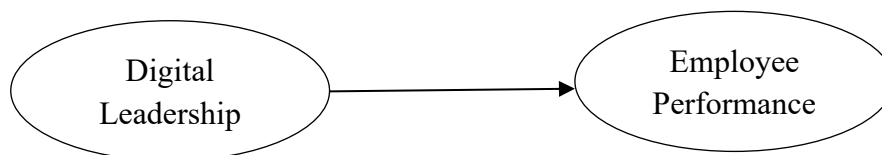
Literature Review

2.1 Digital Leadership

Digital leadership is defined as a process of social influence mediated by information technology, capable of shaping attitudes, behaviors, and performance at both individual and organizational levels [4]. It encompasses competencies such as creating a digital vision, utilizing technology for communication and collaboration, inspiring digital motivation, fostering cultural adaptation, and improving performance through digitalization [4].

2.2 Employee Performance

Employee performance refers to the achievement of work outcomes in line with organizational objectives, based on both quality and quantity standards while adhering to ethical and legal principles [5];[6]. In this study thepPerformance indicators included productivity, efficiency, accuracy, discipline, initiative, leadership, honesty, and creativity [5].

2.3 Conceptual Framework and Hypothesis

This study conceptualized digital leadership as the independent variable (X) and employee performance as the dependent variable (Y) as shown on the following fiqure.

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   ╭──────────────╮                    ╭──────────────╮
   │   Digital    │ ─────────────────▶ │   Employee   │
   │  Leadership  │                    │ Performance  │
   ╰──────────────╯                    ╰──────────────╯
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The hypothesis is:

Ha : Digital leadership positively influences employee performance at the Food Security and Agriculture Office of Binjai City.

Ho : Digital leadership does not positively influence employee performance at the Food Security and Agriculture Office of Binjai City.

Research Methodology

This study applies a quantitative causal-associative research design, aiming to analyze the relationship patterns between variables and to determine the influence of the independent variable on the dependent variable [7].

The study was conducted out from September to December 2025.at the Food Security and Agriculture Office of Binjai City, located at Jl. Jendral Sudirman No. 6, Binjai City. The population in this study comprises all employees of the Food Security and Agriculture Office of Binjai City, totaling 40 employees. [8] define population as the entire group of subjects or objects that are the focus of a study and possess specific characteristics relevant to the research problem.

According to [9], a sample is a subset of the population selected to represent the whole. When the population is relatively small, a saturated sampling technique can be used, in which all members of the population are included. Because the population in this study consists of only 40 employees, the entire population was taken as the sample.

The data collected using structured questionnaires distributed to all employees across divisions within the office. The data will be analyzed using quantitative statistical methods with SPSS version 25.0. Several steps will be performed:

1. Validity testing ensures that questionnaire items accurately measure the intended variables. An item is valid if the correlation coefficient (*r-count*) exceeds the critical value (*r-table*). Reliability testing will use Cronbach's alpha, where a value greater than the critical value indicates reliability.

2. The regression model used in this study is expressed as:
   $Y = a + bX$
   Where:
   Y = Employee Performance
   X = Digital Leadership
   a = Constant
   b = Regression Coefficient

3. The t-test used to assess whether digital leadership significantly affects employee performance [7].

4. The coefficient of determination (R^2) measures how much variance in employee performance can be explained by digital leadership. Values range from 0 to 1, with values closer to 1 indicating stronger influence [7].

Results

4.1   Descriptive Analysis

Descriptive statistics were used to determine the minimum, maximum, mean, and standard deviation values of the research variables.

Table 1. Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Digital Leadership	40	3.25	5.00	4.45	0.49
Employee Performance	40	3.43	5.00	4.37	0.44

Source: SPSS output, version 25.0

The findings showed that both Digital Leadership (M = 4.45, SD = 0.49) and Employee Performance (M = 4.37, SD = 0.44) received scores above the average on a 1–5 scale. This indicates that most respondents perceive digital leadership practices and employee performance in the organization favorably. [10] similarly concluded that digital leadership positively influences work performance in industrial and governmental contexts, reinforcing the significance of leadership in the digital era.

The moderate standard deviation values suggest variation among respondents' perceptions, meaning that while overall sentiment is positive, there are indeed differences in individual views. This diversity in perception highlights the need for leaders to tailor their strategies to different employee needs [3]. Therefore, leadership strategies should remain flexible and inclusive to accommodate varying employee experiences.

4.2   Validity and Reliability Tests

The validity test was conducted using the Corrected Item-Total Correlation. Results showed that all items of both variables had correlation coefficients above the threshold value (0.2387) with significance levels below 0.05. Thus, all items were considered valid [11].

Reliability was tested using Cronbach's Alpha. The values for both variables were above 0.60, indicating strong internal consistency:
1. Digital Leadership   : α = 0.901 (4 items)
2. Employee Performance   : α = 0.919 (8 items)

This confirms that the research instrument was reliable [12].

4.3   Regression Analysis
4.3.1   Simple Linear Regression

A regression analysis was conducted to evaluate the effect of digital leadership on employee performance.

Table 2. Regression Results

Model	B	Std. Error	Beta	t
(Constant)	9.302	2.222	–	4.185
Digital Leadership	1.197	0.124	0.765	9.648

Dependent Variable: Employee Performance

The regression equation can be expressed as:

$$Y = 9.302 + 1.197X$$

This means that, all else being equal, every 1-point increase in digital leadership corresponds to a 1.197-point increase in employee performance. The significance level ($p < 0.001$) confirms a strong and positive relationship.

The regression analysis indicated a robust and positive relationship between Digital Leadership and Employee Performance. Specifically, the regression coefficient (B = 1.197, t = 9.648, $p < 0.001$) reveals that a one-point enhancement in digital leadership corresponds to approximately a 1.197-point improvement in employee performance. Such a finding aligns with modern studies emphasizing the effectiveness of digital leadership in organizational settings. For instance, [13] found that digital leadership significantly enhances employee performance when combined with technology utilization and a supportive culture

4.3.2   Coefficient of Determination (R^2)

The coefficient of determination (R^2) was calculated to measure the proportion of variance in employee performance explained by digital leadership.

Table 3. Coefficient of Determination

Model	R	R²	Adjusted R²
1	0.765	0.585	0.579

Source: SPSS output, version 25.0

The results indicated that 58.5% of the variance in employee performance is explained by digital leadership, while the remaining 41.5% is influenced by other factors outside this model. The correlation coefficient (R = 0.765) shows a strong relationship between the two variables.

The R² value of 0.585 indicated that 58.5% of the variance in employee performance is accounted for by digital leadership, underscoring its substantive influence. In comparative studies, [14] reported an R² of 0.52 in diverse sectors, reinforcing that digital leadership is a crucial determinant of performance across various contexts

4.3.3 Hypothesis Testing (t-Test)
The hypothesis testing was carried out using the t-test.
H_0 : Digital leadership does not positively influence employee performance.
H_a : Digital leadership positively influenced employee performance.

Table 4. t- Test Result

Model	B	Std. Error	Beta	t
(Constant)	9.302	2.222	–	4.185
Digital Leadership	1.197	0.124	0.765	**9.648**

Dependent Variable: Employee Performance

The t-value for digital leadership (t = 9.648) is greater than the t-table value (2.02439, α = 0.05). Additionally, the significance level (p = 0.000 < 0.05) indicates that H_0 is rejected and H_a is accepted. Thus, it is concluded that digital leadership has a positive and significant influence on employee performance at the Food Security and Agriculture Office of Binjai City.

This resonates with findings from [15], who demonstrated that digital leadership empowers employee innovative work behavior, which in turn boosts performance. Similarly, [16] observed that digital leadership significantly improved performance among millennial employees, mediated through creativity.

Taken together, these collective insights paint a consistent narrative: digital leadership is more than a theoretical ideal it translates into real, measurable performance gains. This suggests that leaders who articulate a clear digital vision, foster adaptability, and leverage technology effectively can meaningfully enhance employee outcomes.

Conclusion

This study examined the influence of digital leadership on employee performance at the Food Security and Agriculture Office of Binjai City. The results demonstrated that digital leadership plays a significant role in shaping employee outcomes. Descriptive analysis showed that both digital leadership and employee performance were rated above average, reflecting positive perceptions of leadership practices and work performance. Although some variation in responses was observed, the general trend suggests a supportive organizational climate that values digital leadership.

The regression results confirmed that digital leadership explained 58.5% of the variance in employee performance, with each one-point increase in leadership effectiveness contributing to an estimated 1.197-point improvement in performance. Hypothesis testing further validated

this relationship, underscoring the importance of digital leadership in enhancing employee productivity, efficiency, and engagement. These findings highlight the potential of digital leadership as a strategic resource for improving public sector performance despite the challenges of bureaucracy and resource limitations.

The implications of this study emphasize the urgency of capacity-building programs to strengthen digital leadership competencies among managers and supervisors. Aligning employee development with digital strategies is equally essential to maximize organizational benefits. Beyond this study, future research could expand the model by incorporating variables such as organizational culture, employee engagement, and technological readiness to provide a more comprehensive understanding of how digital leadership fosters sustainable performance improvements across different contexts.

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