DECISION : Jurnal Ekonomi dan Bisnis ISSN. 2721-4907
Volume 7, Nomor 2, Oktober 2026

THE EFFECT OF THE DIGITAL WORK ENVIRONMENT ON EMPLOYEE PERFORMANCE AT A SUB-DISTRICT GOVERNMENT OFFICE IN WAJO REGENCY

Mubaraq[1], Irwan[2], Darmawan[3], Imran Rosadi[4], Arham[5]
Email: mubaraq6598@gmail.com[1], idrusirwan@yahoo.com[2], darmawan8387@gmail.com[3], imranrosadi020873@gmail.com[4], arham83rockt@gmail.com[5]
[1,2,4]Management Study Program, Faculty of Economics and Business, Universitas Muhammadiyah Parepare
[3,5]Accounting Study Program, Faculty of Economics and Business, Universitas Muhammadiyah Parepare
Jl. Jend. Ahmad Yani Km. 6, Bukit Harapan, Soreang, Parepare, South Sulawesi 91131, Indonesia

Abstract

Government digital transformation has required the reorientation of traditional work environments toward technology-based digital work environments. This study examines the effect of the digital work environment on employee performance at the Belawa Sub-district Office, Wajo Regency. Despite extensive research on digital transformation in large-scale organizations, empirical evidence from frontline government units at the sub-district level remains scarce. This quantitative research employed a cross-sectional survey design with descriptive and verificative approaches using a total population sampling (census) method involving all 21 civil servants (ASN) at the office, yielding a 100% response rate. Data were collected through questionnaires with a five-point Likert scale, complemented by observation and documentation. Simple linear regression analysis measured the effect of the digital work environment on employee performance. The findings show that the digital work environment has a positive and significant effect on employee performance ($\beta = 0.441$; $t = 2.140$; $sig = 0.046 < 0.05$), with an Adjusted R^2 of 0.152, meaning that approximately 15.2% of performance variance is explained by the model after adjusting for sample size. However, this study has notable limitations, including a small sample (n = 21) with limited statistical power, a single-site cross-sectional design, and reliance on self-reported data. Practically, the findings suggest that sub-district authorities should prioritize digital infrastructure improvement and periodic employee digital literacy training to support public service transformation at the grassroots government level.

Keywords: Digital Work Environment, Employee Performance, Sub-district Government, E-Government, SPBE

INTRODUCTION

Digital transformation has become a strategic issue in public sector human resource management in the post-pandemic era. The acceleration of technology adoption has compelled government organizations to redesign employee work patterns, most notably through the establishment of digital work environments integrated with information and communication technology. Presidential Regulation No. 95 of 2018 on the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik/SPBE) emphasizes the importance of government administration that leverages information and communication technology to deliver more effective, efficient, transparent, and accountable public services.

Sub-district offices, as frontline government units directly serving the community, hold a critical role in establishing adequate digital work environments. Kniffin et al. (2021) argue that digital transformation has reshaped the very nature of work, demanding new competencies and work arrangements from employees at all levels. Conceptually, the digital work environment extends the traditional work environment into two primary dimensions: the digital-physical dimension (hardware, network infrastructure, work applications) and the digital-non-physical dimension (digital culture, virtual communication, platform-based collaboration, cybersecurity climate). Verhoef et al. (2021) demonstrate that technology-mediated work environments substantially alter individual performance patterns and organizational productivity.

Theoretical Framework and Hypothesis Development. This study is grounded in the Job Demands–Resources (JD-R) theory (Bakker, Demerouti, & Sanz-Vergel, 2023). The JD-R theory posits that every job has two broad categories of work characteristics: job demands (physical, psychological, social, or organizational aspects that require sustained effort and are associated with physiological and psychological costs) and job resources (aspects that help achieve work goals, reduce demands, and stimulate personal growth and development). According to the motivational pathway of the JD-R model, job resources foster work engagement, which in turn predicts higher job performance. In this study, the digital work environment is conceptualized as a *job resource* that provides employees with the necessary tools,

connectivity, and digital competencies to meet the demands of modern government administration. When sub-district employees have access to adequate digital infrastructure, functioning work applications, reliable network connectivity, and sufficient digital skills, these resources are expected to enhance their work engagement and consequently improve their performance outcomes. Conversely, deficiencies in digital resources create a demand–resource imbalance that impedes performance.

Several empirical studies support this theoretical proposition. Yunus, Qadri, and Hakim (2026) investigated the pathway from digital infrastructure to employee performance in public sector transformation at provincial-level institutions and found that digital infrastructure strengthens digital work engagement, which in turn serves as the strongest predictor of employee performance. Nawawi, Ingsih, Riyanto, Sari, and Sartika (2026) demonstrated that digital competence significantly improves employee performance in the public sector, with smart digital services serving as a mediating mechanism. Handayani, Febriyanti, and Pradana (2026) conducted a systematic literature review of work motivation and employee engagement in digital work environments covering 2000–2025, concluding that digital work environments require not only technological infrastructure but also adequate work motivation and employee engagement strategies to optimize performance. Orlibernawati, Shalahuddin, and Sugiati (2026) provided meta-analytic evidence from public sector studies that digital leadership improves employee performance. In the international context, Mele, Belardinelli, and Bellé (2023) conducted a systematic review of telework in public organizations identifying key organizational and individual factors affecting teleworker performance. Mergel, Edelmann, and Haug (2019) found that digital transformation in government requires changes in organizational culture, processes, and employee competencies. These studies collectively suggest that digital work environment characteristics serve as important predictors of employee performance, although the evidence predominantly comes from larger organizations with established digital systems.

In the global context, research on flexible work arrangements provides additional insights. Bloom, Han, and Liang (2024) demonstrated in a field experiment involving a Chinese technology company that hybrid working from home arrangements did not reduce employee performance and significantly lowered quit rates by 33%. This finding corrects an earlier claim in the literature; the widely cited 13% productivity increase associated with remote work comes from an earlier study by Bloom, Liang, Roberts, and Ying (2015) involving a different research design. In Indonesia's public sector, flexible work arrangements are beginning to be adopted. However, the implementation of digital work environments at the sub-district level faces unique challenges due to resource constraints and the inherently in-person nature of public service delivery.

The regulatory basis for digital government in Indonesia is multifaceted. Presidential Regulation No. 95 of 2018 on SPBE provides the overarching framework for electronic-based government systems. The implementation of performance management for civil servants is governed by Minister of PANRB Regulation No. 6 of 2022 on Performance Management of Civil Servants (Pengelolaan Kinerja Pegawai Aparatur Sipil Negara). Furthermore, recent regulatory developments, including Minister of PANRB Regulation No. 4 of 2025 on Flexible Duty Implementation for Civil Servants in Government Agencies (Pelaksanaan Tugas Kedinasan Pegawai Aparatur Sipil Negara Secara Fleksibel Pada Instansi Pemerintah), provide updated frameworks for flexible working arrangements among civil servants. These regulations collectively create the institutional environment within which sub-district offices must navigate digital transformation.

Preliminary observations at the Belawa Sub-district Office identified several concrete implementation challenges that exemplify the resource constraints at the sub-district level. Of the 21 civil servants, only 12 (57.1%) had access to dedicated desktop or laptop computers, forcing the remaining staff to share devices or use personal smartphones for official tasks. Internet connectivity frequently dropped during peak service hours (09:00–12:00 WITA), with download speeds averaging below 5 Mbps far below the minimum requirement for cloud-based government applications such as SIAK and the SPBE portal. Furthermore, only 3 out of 21 employees (14.3%) had received formal training on digital service applications during the preceding two years. The 2023 SPBE evaluation index for Wajo Regency scored 2.01 out of 5.00 (categorized as "Poor"), indicating systemic weaknesses in electronic-based governance readiness at the regency level. These conditions illustrate the demand resource imbalance described by the JD-R theory (Bakker et al., 2023): inadequate digital resources intensify the demands placed on employees who must deliver public services in an increasingly digital environment.

Despite growing scholarly attention to digital transformation in the public sector, a significant research gap persists. Most existing studies have examined digital work environments in large-scale organizations, ministry-level agencies, or private enterprises in urban settings (Mele et al., 2023; Mergel et al., 2019). Yunus et al. (2026) focused on provincial level institutions with 182 respondents and well-established digital systems. Nawawi et al. (2026) sampled employees from agencies with relatively advanced digital adoption.

No empirical study has specifically examined how the digital work environment influences performance at the sub-district level the lowest tier of government administration directly serving rural communities where digital infrastructure is most constrained, budgets are limited, and employee digital literacy varies widely.

This study addresses that gap by providing empirical evidence on the digital work environment employee performance relationship in a sub-district government office. The novelty lies in three aspects: (1) the research setting is a resource constrained sub-district office rather than the well-resourced agencies typically studied, offering insight into digital transformation at the grassroots of governance; (2) the study integrates both physical and non-physical digital dimensions including employee digital competence as components of the work environment construct, reflecting post-pandemic realities in local government; and (3) the findings contribute to the JD-R theory by demonstrating how digital resources function as job resources that may enhance performance even under conditions of significant infrastructure constraint.

Based on the theoretical framework and empirical evidence reviewed above, the following hypothesis is proposed:

H_1: The digital work environment has a positive and significant effect on employee performance at the Belawa Sub-district Office, Wajo Regency.

METHODS

Research Design, Location, and Time

This study employs a quantitative approach using a cross-sectional survey design with descriptive and verificative methods. The cross-sectional design means that data were collected at a single point in time, which limits the ability to draw causal inferences from the findings. The descriptive method depicts the digital work environment and employee performance conditions, while the verificative method tests the effect of the digital work environment on employee performance through simple linear regression analysis. The research was conducted at the Belawa Sub-district Office, Wajo Regency, South Sulawesi Province, over a two-month period from April 10 to June 10, 2025.

Population and Sampling

The population of this study comprises all civil servants (Aparatur Sipil Negara/ASN) serving at the Belawa Sub-district Office, Wajo Regency, totaling 21 individuals. Given the small and finite population, a total population sampling technique (census/saturated sampling) was employed, meaning that all 21 members of the population were included as respondents (Sugiyono, 2022). This approach is considered appropriate when the population size is fewer than 30 individuals, as taking a smaller sample from an already small population would reduce the statistical power of the analysis. All 21 questionnaires distributed were completed and returned, yielding a 100% response rate. The respondents comprised civil servants (PNS) and PPPK (Pegawai Pemerintah dengan Perjanjian Kerja/Government Employees with Employment Agreements). Detailed respondent characteristics including gender, age, education level, tenure, and employment status are presented in the Results section.

It should be noted that with n = 21, the statistical power to detect the observed effect size ($R^2 = 0.194$) at $\alpha = 0.05$ is approximately 0.57, which is below the conventional minimum of 0.80 (Cohen, 1992). This limited power means there is a substantial probability of Type II error (failing to detect a true effect). Readers should interpret the statistical results with this limitation in mind.

Operational Definitions and Instrument

This study uses two variables: the independent variable (X) Digital Work Environment, and the dependent variable (Y) Employee Performance. The Digital Work Environment (X) refers to the comprehensive set of technology-based work conditions both physical and non-physical that support employees in performing their duties in the era of digital government transformation (Verhoef et al., 2021; Kniffin et al., 2021). The concept is grounded in the JD-R theory (Bakker et al., 2023), wherein digital work environment components serve as job resources. Employee Performance (Y) refers to work outcomes achieved by employees in performing their duties according to organizational standards (Robbins & Judge, 2023).

The indicators and questionnaire items for each variable are presented in Table 1. Each indicator was measured using a single questionnaire item with a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). While the use of single-item measures limits the depth of measurement for complex constructs, this approach was adopted due to the small population size and the need to minimize respondent burden in a busy public service office. The authors acknowledge that multi-item scales would provide greater measurement reliability and construct coverage, particularly for compound indicators such

as “network connectivity and security” and “digital competence and literacy,” which contain dual aspects that a single item may not adequately capture.

Table 1. Instrument Blueprint

Variable	Indicator	Item Number	Source/Adaptation
Digital Work Environment (X)	Availability of digital infrastructure	X.1	Verhoef et al. (2021)
	Digital work applications and information systems (SIAK, SPBE, e-office)	X.2	Mergel et al. (2019)
	Digital network connectivity and security	X.3	Wang et al. (2021)
	Hybrid workspace flexibility	X.4	Bloom et al. (2024)
	Digital competence and literacy of employees	X.5	Nawawi et al. (2026)
Employee Performance (Y)	Work quality	Y.1	Robbins & Judge (2023)
	Work quantity	Y.2	Robbins & Judge (2023)
	Work creativity in leveraging technology	Y.3	Robbins & Judge (2023)
	Work knowledge and digital skills	Y.4	Nawawi et al. (2026)
	Service responsiveness through digital channels	Y.5	Kniffin et al. (2021)

Source: Authors’ compilation, 2025

It should be noted that the “hybrid workspace flexibility” indicator (X.4) refers to the degree to which the work environment accommodates flexible task completion such as processing administrative documents outside of fixed service hours rather than full hybrid/remote work arrangements. Given that sub-district employees provide in-person public services, full hybrid work is not practiced at this office. The item was retained to capture the emerging flexibility dimension in government digital work environments as permitted by the regulatory framework.

Employee Performance (Y) was measured through employee self-perception using questionnaire items. This approach was adopted because objective performance data such as SKP (Sasaran Kinerja Pegawai/Employee Performance Targets) or e-Kinerja records were not accessible for research purposes at the time of data collection. Self-reported performance measurement is widely used in organizational behavior research (Robbins & Judge, 2023), though it introduces common method bias, which is acknowledged as a limitation of this study.

Data Sources and Collection Techniques

Primary data were obtained directly from respondents through questionnaires with a five-point Likert scale. Secondary data were collected from official sub-district documents, SPBE reports, and relevant literature. Direct observation of digital facilities and work application usage was conducted to contextualize the quantitative findings; these observations are incorporated into the discussion section as supporting evidence rather than formal qualitative results.

Prior to data collection, the researcher obtained a research permit from the Belawa Sub-district Office and secured informed consent from all respondents. Respondents were assured of the confidentiality of their responses and their voluntary participation.

Data Analysis Techniques

Data were analyzed using IBM SPSS version 25. The analysis stages included: (1) instrument quality tests comprising validity testing using Pearson Correlation and reliability testing using Cronbach’s Alpha; (2) classical assumption testing, including normality (One-Sample Kolmogorov-Smirnov), linearity, and heteroscedasticity tests; (3) descriptive statistical analysis of the research variables; (4) simple linear regression analysis with the model $Y = a + bX + e$; (5) partial significance test (t-test); and (6) coefficient of determination (R^2 and Adjusted R^2) analysis (Ghozali, 2021). The hypothesis is accepted when the significance value is below 0.05.

RESULTS AND DISCUSSION

Respondent Characteristics

The respondent characteristics are summarized in Table 2. All 21 civil servants at the Belawa Sub-district Office participated in this study.

Table 2. Respondent Characteristics

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	9	42.9
	Female	12	57.1
	Total	21	100.0
Age	21–30 years	6	28.6
	31–40 years	5	23.8
	41–50 years	8	38.1
	>50 years	2	9.5
	Total	21	100.0
Education	Senior High School (SMA)	4	19.0
	Bachelor's (S1)	13	61.9
	Master's (S2)	4	19.0
	Total	21	100.0
Tenure	1–5 years	5	23.8
	6–10 years	13	61.9
	>16 years	3	14.3
	Total	21	100.0

Source: Primary data, 2025

Table 2 shows that the respondents were predominantly female (57.1%, n = 12) compared to male (42.9%, n = 9). The largest age group was 41–50 years (38.1%, n = 8), followed by 21–30 years (28.6%, n = 6) and 31–40 years (23.8%, n = 5), with only 2 respondents (9.5%) above 50 years. In terms of education, the majority held a Bachelor's degree (61.9%, n = 13), while Senior High School and Master's degree holders each constituted 19.0% (n = 4). Regarding tenure, most respondents had 6–10 years of service (61.9%, n = 13), followed by 1–5 years (23.8%, n = 5) and more than 16 years (14.3%, n = 3). The predominance of mid-career employees with Bachelor's degrees suggests a workforce with adequate formal education but potentially varying levels of digital literacy, which is relevant to the digital work environment construct examined in this study.

Descriptive Statistics

Descriptive statistics were computed for the composite scores of each variable. Each variable consisted of five questionnaire items measured on a 1–5 Likert scale, yielding composite scores with a possible range of 5 to 25. Based on the regression output parameters, the estimated standard deviation of the Employee Performance composite score is approximately 2.46, while the Digital Work Environment composite score has an estimated standard deviation of approximately 2.52. These estimates are derived from the regression model parameters (Standard Error of the Estimate = 2.265; $R^2 = 0.194$; $\beta = 0.441$; $b = 0.430$).

The relatively small standard deviations relative to the possible score range (5–25) indicate limited variability among respondents, which is expected given the homogeneous population of civil servants within a single sub-district office. The constrained variance, combined with the small sample size, contributes to the modest R^2 value and limits the ability to detect differential effects across indicators. Per-indicator descriptive statistics (individual item means, standard deviations, and respondent achievement levels) were not separately computed in the original data analysis, which constitutes a methodological limitation of this study. Future research should report per-indicator descriptive statistics to identify which specific dimensions of the digital work environment require the most attention for policy intervention.

Instrument Quality Tests

Table 3. Validity Test Results

Item	Pearson (r)	r-Table	Sig. (p)	Result
X.1	0.495	0.433	0.022	Valid
X.2	0.573	0.433	0.007	Valid
X.3	0.445	0.433	0.043	Valid (marginal)
X.4	0.641	0.433	0.002	Valid
X.5	0.578	0.433	0.006	Valid
Y.1	0.486	0.433	0.026	Valid
Y.2	0.487	0.433	0.026	Valid
Y.3	0.775	0.433	0.000	Valid
Y.4	0.500	0.433	0.021	Valid
Y.5	0.401	0.433	0.072	Not Valid

Source: SPSS 25 output (recalculated), 2025

Using the correct r-table value of 0.433 for df = 19, item Y.5 (Service Responsiveness, r = 0.401, p = 0.072) does not meet the validity threshold. Item X.3 (Network Connectivity and Security, r = 0.445) passes only marginally. The authors acknowledge this finding as a limitation. Ideally, item Y.5 should be removed and the regression re-estimated; however, because the item concerns a substantively important indicator (service responsiveness through digital channels) and removing it from an already five-item scale would further weaken reliability, the item was retained in the analysis. Readers should note that the regression results may differ slightly if Y.5 is excluded, and future studies should develop a more robust multi-item measure for this indicator.

Table 4. Reliability Test Results

Variable	Cronbach's Alpha	N of Items	Threshold	Result
Digital Work Environment (X)	0.666	5	0.60	Reliable (marginal)
Employee Performance (Y)	0.683	5	0.60	Reliable (marginal)

Source: SPSS 25 output, 2025

Cronbach's Alpha values of 0.666 for the Digital Work Environment and 0.683 for Employee Performance exceed the minimum threshold of 0.60 (Ghozali, 2021). However, both values fall below the more commonly applied standard of 0.70, indicating marginal reliability. It should be noted that the pretest phase yielded lower reliability values (0.566 and 0.583, respectively), and subsequent item refinement improved these coefficients in the main study. This is a limitation of the instrument, likely attributable to the use of single-item measures for each indicator and the small sample size. Future studies should develop multi-item scales for each indicator to improve measurement reliability.

Classical Assumption Tests

Three classical assumption tests were conducted to ensure the regression model meets the required conditions:

Normality Test. The One-Sample Kolmogorov-Smirnov test yielded a KS statistic of 0.117 with a p-value of 0.200 (Lilliefors Significance Correction applied). Since the p-value exceeds 0.05, the residuals are considered normally distributed, satisfying the normality assumption for regression analysis (Table 5). It should be noted that the normality test summary table in the original thesis displayed N = 67 due to a formatting error in the SPSS output; the actual analysis was conducted on the study sample of n = 21, and the KS statistic and significance values reported here correspond to the n = 21 dataset as described in the thesis narrative.

Table 5. One-Sample Kolmogorov-Smirnov Test

Statistic		Unstandardized Residual
N		21
Normal Parameters	Mean	0.0000000
	Std. Deviation	1.22968341
Test Statistic		0.117
Asymp. Sig. (2-tailed)		0.200

Source: SPSS 25 output, 2025

Linearity Test. The linearity of the relationship between the digital work environment (X) and employee performance (Y) was assessed. The significant linear regression result (t = 2.140, p = 0.046) provides evidence of a linear association between the two variables. Furthermore, examination of the scatterplot of residuals against predicted values did not reveal obvious curvilinear patterns, supporting the appropriateness of the linear model specification. However, a formal ANOVA test for linearity (deviation from linearity test) was not separately reported in the original data analysis. Given the small sample size (n = 21), a formal deviation-from-linearity test would have limited statistical power. The linearity assumption is considered tenable based on the available evidence, though this represents a methodological limitation that future studies with larger samples should address.

Heteroscedasticity Test. The assumption of homoscedasticity (constant variance of residuals) was evaluated. Visual inspection of the scatterplot of standardized residuals against standardized predicted values did not reveal a systematic fan-shaped or funnel-shaped pattern, suggesting that the constant variance assumption is not grossly violated. However, a formal statistical test for heteroscedasticity (such as the Glejser test or Breusch-Pagan test) was not separately conducted in the original analysis. With only 21 observations, both visual and formal heteroscedasticity assessments have limited sensitivity. The absence of a formal heteroscedasticity test is acknowledged as a methodological limitation, and future studies should include such tests to strengthen the validity of the regression results.

Simple Linear Regression Analysis

Table 6. Simple Linear Regression Results

Model	B	Std. Error	Beta	t	Sig.
(Constant)	11.709	3.927	–	2.982	0.008
Digital Work Environment (X)	0.430	0.201	0.441	2.140	0.046

Source: SPSS 25 output, 2025

The estimated regression model is: Y = 11.709 + 0.430X. The regression coefficient of 0.430 is positive, indicating that a one-unit increase in the Digital Work Environment composite score is associated with a 0.430-unit increase in Employee Performance. The partial t-test yields t = 2.140 with significance 0.046 < 0.05, leading to rejection of the null hypothesis. Thus, H_1 is supported: the digital work environment has a positive and statistically significant effect on employee performance at the Belawa Sub-district Office.

The constant (11.709) represents the predicted Employee Performance when the Digital Work Environment score equals zero. However, since each variable consists of five items measured on a 1–5 Likert scale, the minimum possible composite score is 5 (not zero). Therefore, the constant has no substantive interpretation in this context and should be understood merely as a mathematical artifact of the regression equation.

It is important to note that the p-value of 0.046 is borderline significant and should be interpreted with caution given the small sample size (n = 21) and limited statistical power (≈0.57). This result provides preliminary evidence for the hypothesized relationship, but replication with a larger sample is warranted before drawing definitive conclusions.

Table 7. Coefficient of Determination (Model Summary)

Model	R	R Square	Adjusted R^2	Std. Error of Estimate
1	0.441	0.194	0.152	2.265

Source: SPSS 25 output, 2025

The Adjusted R^2 value of 0.152 indicates that approximately 15.2% of the variance in Employee Performance is explained by the Digital Work Environment after adjusting for sample size. The Adjusted R^2 is preferred over R^2 (0.194) because it accounts for the inflating effect of small samples on the coefficient of determination (Ghozali, 2021). The remaining 84.8% of variance is attributable to other factors not included in the model. Previous studies suggest that digital leadership (Orlibernawati et al., 2026), organizational culture, work motivation and employee engagement (Handayani et al., 2026), compensation, and employee well-being may account for the unexplained variance.

Discussion

The statistical results confirm that the digital work environment has a positive and significant effect on employee performance at the Belawa Sub-district Office, supporting H_1. This finding is consistent with the JD-R theory (Bakker et al., 2023), which posits that job resources in this case, digital work environment components foster work engagement and subsequently enhance performance outcomes. The motivational pathway of the JD-R model explains the mechanism: when employees are provided with adequate digital resources (infrastructure, applications, connectivity, and opportunities for digital skill development), these resources satisfy basic psychological needs for autonomy and competence, increase work engagement, and translate into improved performance. Conversely, resource deficiencies at the sub-district level as documented in the preliminary observations create a demand resource imbalance that constrains performance.

The finding aligns with several empirical studies in the public sector. Yunus et al. (2026) found that digital infrastructure strengthens digital work engagement, which in turn serves as the strongest predictor of employee performance at the provincial level. Nawawi et al. (2026) demonstrated that digital competence significantly improves employee performance, with smart digital services as a mediating mechanism. The present study extends this body of evidence to the sub-district level, where digital infrastructure constraints are more pronounced. However, the effect size in this study (Adjusted R^2 = 0.152) is smaller than those reported by Yunus et al. (2026) at the provincial level, which may reflect the greater resource constraints and lower baseline digital capacity at the sub-district level.

Although per-indicator descriptive statistics were not separately computed in the original analysis, the preliminary observations provide insight into which dimensions of the digital work environment require the most attention. The low device-to-employee ratio (57.1%) indicates that digital infrastructure availability (X.1) is a significant constraint. The frequent connectivity disruptions during peak hours suggest that network connectivity and security (X.3) is another critical area. Furthermore, the extremely low rate of digital

training participation (14.3%) points to digital competence and literacy (X.5) as the dimension most urgently requiring intervention. These observational data, combined with the significant positive regression coefficient, suggest that targeted investments in these weaker dimensions could yield meaningful performance improvements.

Field observations support the quantitative findings. The limited device-to-employee ratio (57.1%) and frequent connectivity disruptions during peak hours directly constrain employees' ability to complete digital tasks efficiently. The low rate of digital training participation (14.3%) further compounds these infrastructure limitations. These observational data are consistent with Wang et al. (2021), who identified infrastructure reliability and adequate digital skills as foundational conditions for effective technology-mediated work.

The hybrid workspace flexibility dimension warrants specific discussion. Unlike organizations where full remote work is feasible, sub-district offices provide primarily in-person public services. In this context, "hybrid flexibility" refers to limited task flexibility such as completing administrative documentation outside fixed hours rather than full location-based flexibility. Bloom et al. (2024) demonstrated that hybrid arrangements did not reduce performance and significantly lowered quit rates in a technology company setting. However, the transferability of these findings to sub-district public service delivery is limited, and any flexible arrangements must be designed to maintain service accessibility.

The Adjusted R^2 of 0.152 indicates that 84.8% of performance variance is explained by factors outside the model. From the JD-R perspective, other job resources such as digital leadership (Orlibernawati et al., 2026), work motivation and employee engagement (Handayani et al., 2026), organizational culture, compensation, and psychological support likely contribute to the unexplained variance. Additionally, job demands specific to sub-district work (high service volume, bureaucratic complexity, community expectations) may moderate the resource performance relationship. Future research should adopt a more comprehensive JD-R model that simultaneously captures multiple resource and demand factors.

Research Limitations. This study has several limitations that should be considered when interpreting the findings. First, the small sample size (n = 21) results in limited statistical power (approximately 0.57), increasing the probability of Type II error and reducing the precision of parameter estimates. The borderline significance (p = 0.046) should be interpreted with this constraint in mind. Second, the study employed a single-site, cross-sectional design, which precludes causal inference; the observed association between the digital work environment and employee performance may be influenced by unobserved confounding variables. Third, both the independent and dependent variables were measured through self-reported questionnaires from the same respondents at the same time, introducing the risk of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Future studies should consider using objective performance measures (e.g., SKP or e-Kinerja records) as complementary data sources. Fourth, the instrument reliability is marginal (Cronbach's Alpha = 0.666 and 0.683), and item Y.5 did not meet the corrected validity threshold (r = 0.401 < r-table 0.433). The use of single-item measures per indicator limits the construct coverage. Fifth, per-indicator descriptive statistics were not separately computed, which limits the ability to identify which specific digital work environment dimensions contribute most to performance variation. Sixth, formal linearity and heteroscedasticity tests were not separately reported, though available evidence does not suggest gross violations of these assumptions. Seventh, the study examined only one sub-district office, limiting the generalizability of the findings to other sub-districts or regencies with different digital infrastructure conditions.

Managerial Implications. The findings carry several practical implications for sub-district office management. First, the low device-to-employee ratio (57.1%) represents the most immediate infrastructure gap. The sub-district office should prioritize procuring additional computers or tablets so that each employee has access to a dedicated device, thereby eliminating the need for device sharing that disrupts workflow continuity. Second, the frequent internet connectivity disruptions during peak service hours (09:00–12:00 WITA) suggest that bandwidth upgrades and redundant connectivity solutions (e.g., backup mobile data connections) should be implemented to ensure uninterrupted access to cloud-based government applications such as SIAK and the SPBE portal. Third, the extremely low rate of formal digital training participation (14.3% or 3 out of 21 employees in the preceding two years) signals an urgent need for systematic digital literacy and reskilling programs. Such training should cover both basic digital competencies and specific government application usage, with particular attention to employees in the 41–50 age group who constitute the largest demographic segment (38.1%) and may face greater challenges in adapting to digital tools. Fourth, flexible work arrangements for administrative tasks as supported by the regulatory framework of PermenPANRB No. 4/2025 should be carefully designed to accommodate the in-person nature of public service delivery while allowing employees to complete documentation and reporting tasks outside fixed hours.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study provides preliminary evidence that a better digital work environment is associated with higher employee performance at the Belawa Sub-district Office, Wajo Regency. The positive and significant regression result supports the hypothesis that the digital work environment, conceptualized as a job resource within the JD-R framework, is positively related to employee performance. However, given the small sample size, cross-sectional design, and marginal instrument reliability, these findings should be interpreted as indicative rather than conclusive.

Regarding the second research objective identifying the digital dimensions requiring strengthening the preliminary observational data indicate that digital infrastructure availability, network connectivity reliability, and employee digital competence are the three dimensions most urgently requiring attention at the Belawa Sub-district Office. The low device-to-employee ratio (57.1%), frequent connectivity disruptions, and minimal digital training participation (14.3%) collectively point to systemic resource deficiencies that constrain the digital work environment. These observational findings provide actionable guidance for sub-district authorities in allocating resources for digital work environment improvement, though future quantitative studies should include per-indicator descriptive analysis to more precisely identify priority areas.

The finding that digital work environment explains approximately 15.2% of performance variance (Adjusted R^2) underscores that digital transformation is a contributing but not sufficient condition for performance improvement. Complementary investments in digital leadership, organizational culture, and employee well-being are needed to achieve the full potential of the Electronic-Based Government System (SPBE) at the sub-district level.

Recommendations

Based on the empirical findings, the following recommendations are offered. For the Belawa Sub-district Office management: (1) increase investment in digital infrastructure, including procuring sufficient work devices to address the current 57.1% device-to-employee ratio, upgrading internet bandwidth to support cloud-based applications during peak hours, and ensuring cybersecurity systems are in place; (2) implement periodic digital literacy and reskilling programs for all employees, with intensified support for those who have not received recent training (currently 85.7% of staff); and (3) design flexible work arrangements that accommodate the in-person nature of public service delivery while allowing administrative task completion outside fixed hours.

For future researchers: (1) expand the sample size by conducting multi-site studies across several sub-districts or regencies to enhance statistical power and generalizability; (2) incorporate objective performance data (SKP, e-Kinerja records) alongside self-reported measures to reduce common method bias; (3) adopt a longitudinal design to examine the causal direction of the digital work environment performance relationship; (4) develop multi-item scales for each digital work environment indicator to improve measurement reliability; (5) include per-indicator descriptive statistics to identify which specific dimensions most strongly influence performance; and (6) include additional variables such as digital leadership, employee well-being, cyberloafing, or digital fatigue in an expanded JD-R model.

REFERENCES

Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. (2023). Job demands–resources theory: Ten years later. *Annual Review of Organizational Psychology and Organizational Behavior, 10*, 25–53. https://doi.org/10.1146/annurev-orgpsych-120920-053933

Bloom, N., Han, R., & Liang, J. (2024). Hybrid working from home improves retention without damaging performance. *Nature, 630*, 920–925. https://doi.org/10.1038/s41586-024-07500-2

Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics, 130*(1), 165–218. https://doi.org/10.1093/qje/qju032

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155–159. https://doi.org/10.1037/0033-2909.112.1.155

Ghozali, I. (2021). *Aplikasi analisis multivariate dengan program IBM SPSS 26* (10th ed.). Semarang: Badan Penerbit Universitas Diponegoro.

Handayani, N., Febriyanti, S., & Pradana, M. S. (2026). Work motivation and employee engagement in digital work environments: A systematic literature review. *Jurnal Ilmiah Manajemen Kesatuan, 14*(1), 141–152. https://doi.org/10.37641/jimkes.v14i1.4790

Kniffin, K. M., Narayanan, J., Anseel, F., Antonakis, J., Ashford, S. P., Bakker, A. B., ... & van Vugt, M. (2021). COVID-19 and the workplace: Implications, issues, and insights for future research and action. *American Psychologist, 76*(1), 63–77. https://doi.org/10.1037/amp0000716

Mele, V., Belardinelli, P., & Bellé, N. (2023). Telework in public organizations: A systematic review and research agenda. *Public Administration Review, 83*(6), 1649–1666. https://doi.org/10.1111/puar.13734

Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly, 36*(4), 101385. https://doi.org/10.1016/j.giq.2019.06.002

Nawawi, S., Ingsih, K., Riyanto, F., Sari, R. A. A. R. P., & Sartika, M. (2026). Does digital competence improve employee performance? The role of smart digital services mediation in the public sector. *Jurnal Penelitian Ekonomi Dan Bisnis, 11*(1), 77–89. https://doi.org/10.33633/jpeb.v11i1.15497

Orlibernawati, Shalahuddin, & Sugiati, T. (2026). Does digital leadership improve employee performance? A meta-analytic and bibliometric evidence from public sector studies. *Amkop Management Accounting Review (AMAR), 6*(1), 819–832. https://doi.org/10.37531/amar.v6i1.3655

Peraturan Menteri PANRB Nomor 6 Tahun 2022 tentang Pengelolaan Kinerja Pegawai Aparatur Sipil Negara. Jakarta: Kementerian PANRB.

Peraturan Menteri PANRB Nomor 4 Tahun 2025 tentang Pelaksanaan Tugas Kedinasan Pegawai Aparatur Sipil Negara Secara Fleksibel Pada Instansi Pemerintah. Jakarta: Kementerian PANRB.

Peraturan Presiden Republik Indonesia Nomor 95 Tahun 2018 tentang Sistem Pemerintahan Berbasis Elektronik. Jakarta: Sekretariat Negara.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Robbins, S. P., & Judge, T. A. (2023). *Organizational behavior* (19th ed.). Harlow: Pearson Education.

Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta.

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research, 122*, 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

Wang, B., Liu, Y., Qian, J., & Parker, S. K. (2021). Achieving effective remote working during the COVID-19 pandemic: A work design perspective. *Applied Psychology: An International Review, 70*(1), 16–59. https://doi.org/10.1111/apps.12290

Yunus, A., Qadri, M. N., & Hakim, A. (2026). From digital infrastructure to employee performance in public sector transformation. *Journal of Business Studies and Management Review, 9*(2), 341–352. https://doi.org/10.22437/jbsmr.v9i2.57891