

DIGITAL LEADERSHIP AND DIGITAL COMPETENCY ON EMPLOYEE PERFORMANCE: THE MEDIATING ROLE OF WORK ENGAGEMENT IN MSMEs OF PURBALINGGA REGENCY, CENTRAL JAVA, INDONESIA

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ABSTRACT

This research investigates the influence of digital leadership and digital competency on employee performance, with work engagement as a mediating variable, among MSME (Micro, Small, and Medium Enterprises) workers in Purbalingga Regency, Central Java, Indonesia. Purbalingga's MSME sector anchored by distinctive industries including false eyelash manufacturing, knitted fabric production, and broom crafts faces mounting pressure to adopt digital technologies while managing the human resource challenges inherent in rapid digital transformation. Employing a quantitative research design with Partial Least Squares Structural Equation Modeling (PLS-SEM) on a sample of 305 MSME employees drawn through stratified random sampling across five sub-districts, this research tests seven hypotheses derived from the Job Demands-Resources (JD-R) model, Transformational Leadership Theory, and Digital Human Capital Theory. Results demonstrate that digital leadership ($\beta = 0.312$, $p < 0.001$) and digital competency ($\beta = 0.347$, $p < 0.001$) both exert significant positive direct effects on employee performance. Crucially, work engagement partially mediates both relationships: the mediated path from digital leadership ($\beta = 0.174$, CI [0.113, 0.241]) and digital competency ($\beta = 0.190$, CI [0.132, 0.253]) to performance are statistically significant. The model explains 58.7% of variance in employee performance ($R^2 = 0.587$) and 51.2% in work engagement ($R^2 = 0.512$). These findings contribute empirical evidence from an underexplored peripheral industrial context and imply that MSME digital transformation strategies must invest simultaneously in leadership development, employee digital competency training, and work engagement cultivation to maximize performance returns.

Keywords: *digital leadership; digital competency; work engagement; employee performance; MSME; PLS-SEM; Purbalingga*

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1. INTRODUCTION

The fourth industrial revolution (Industry 4.0) and the subsequent emergence of Society 5.0 have fundamentally redefined the competency requirements and leadership paradigms of organizations across all sectors and scales. For Indonesia's Micro, Small, and Medium Enterprises (MSMEs) which contribute 61.07% of Gross Domestic Product and absorb 97% of the national workforce (Kementerian Koperasi dan UKM, 2023) the imperative of digital transformation is not merely a competitive strategy but an existential adaptation requirement in an increasingly digitally mediated market environment.

Purbalingga Regency in Central Java presents a distinctive and underexplored context for researching digital transformation in MSMEs. The regency is home to three iconic, nationally significant MSME industries: false eyelash (bulu mata palsu) manufacturing employing approximately 38,000 workers and generating IDR 1.4 trillion in annual export value; knitted rambut (hair) production; and traditional broom (sapu gelagah) craft industries. These labor-intensive industries, historically organized around home-based production systems, are undergoing rapid formalization and technological upgrading driven by export market demands, retail platform integration, and post-COVID digital commercial adaptation. Dinas Koperasi dan UKM Purbalingga (2024) reports

that digitally active MSMEs in the regency demonstrated 34.7% higher revenue growth compared to non-digital counterparts between 2021 and 2024.

Within this transformation context, two human resource dimensions emerge as critical determinants of digital transition success: digital leadership and digital competency. Digital leadership defined as the capacity of organizational leaders to formulate, communicate, and implement digital visions while cultivating digital innovation cultures (Hess et al., 2016; Müller & Tertilt, 2018) determines the strategic direction and enabling environment for digital adoption. Digital competency the integrated set of knowledge, skills, and attitudes enabling employees to effectively utilize digital technologies in their work roles (European Commission, 2013; Redecker, 2017) determines the operational capacity to convert digital tools into performance outcomes.

However, organizational behavior research increasingly recognizes that the relationship between capabilities (both leadership and competency) and performance outcomes is rarely direct. The Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007) posits that job resources including enriching leadership and skill development generate employee engagement through a motivational pathway, which in turn drives performance. Work engagement characterized by Schaufeli et al. (2002) as a positive, fulfilling, work-related state of mind comprising vigor, dedication, and absorption operates as the psychological mechanism through which organizational resources are converted into sustained performance outcomes.

Despite the theoretical significance of these relationships, empirical research examining the triadic model of digital leadership–digital competency–work engagement–employee performance within MSME contexts in Indonesia's peripheral industrial regions remains limited. Most existing studies focus on large corporations (Schwarz Müller et al., 2018; Kane et al., 2019) or urban service sectors (Hartanto & Sari, 2022), leaving a significant contextual gap regarding how these dynamics operate in labor-intensive, craft-based, export-oriented MSMEs.

This research addresses this gap through four research objectives: (1) to examine the direct effects of digital leadership and digital competency on employee performance among MSME workers in Purbalingga; (2) to analyze the influence of digital leadership and digital competency on work engagement; (3) to test the effect of work engagement on employee performance; and (4) to evaluate the mediating role of work engagement in the digital leadership–performance and digital competency–performance relationships. The findings contribute to digital human resource management theory and provide actionable guidance for MSME owners, MSME development agencies (Dinas Koperasi UKM), and regional government digital transformation programs.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Digital Leadership and Employee Performance

Digital leadership represents the evolution of transformational leadership theory (Bass, 1985; Burns, 1978) into the digital era, encompassing the leader's capacity to inspire digital vision, facilitate technology adoption, manage digital change, and cultivate data-driven organizational cultures (Hess et al., 2016; Kreutzer et al., 2017). Müller and Tertilt (2018) operationalize digital leadership through five dimensions: digital visioning, digital empowerment, digital communication, digital collaboration, and technology-embedded decision-making dimensions that the present research adopts as measurement indicators.

The relationship between digital leadership and employee performance is theoretically grounded in social learning theory (Bandura, 1977) and the resource-based view (Barney, 1991). Leaders who exhibit strong digital competencies and communicate clear digital visions provide employees with behavioral models for digital work practices and establish organizational norms that reinforce digital performance outcomes. Empirically, Schwarz Müller et al. (2018) demonstrated that digital leadership styles significantly predict employee digital work performance across German manufacturing firms, while Kane et al. (2019), in a cross-industry research of 4,300 organizations, found that digital leadership maturity is the primary organizational differentiator in successful digital transformation outcomes.

In the Indonesian MSME context, Hartanto and Sari (2022) found a significant positive effect of digital leadership on employee performance ($\beta = 0.43$, $p < 0.01$) among small enterprises in Yogyakarta's creative industry.

Pratama and Nugroho (2023) extended this finding to the manufacturing MSME context in Central Java, confirming the positive leadership-performance relationship ($r = 0.512$, $p < 0.001$) with effect size moderated by organizational digital maturity. Based on this theoretical and empirical foundation, the following hypothesis is proposed:

H1: *Digital leadership has a significant positive effect on employee performance in MSMEs of Purbalingga Regency*

2.2 Digital Competency and Employee Performance

Digital competency alternatively termed digital literacy, digital skills, or e-competency in the literature refers to the integrated set of knowledge, technical skills, and attitudinal dispositions enabling individuals to effectively use digital information and communication technologies in professional and personal contexts (European Commission DigComp Framework, 2013; Redecker, 2017). The DigComp 2.2 framework (Vuorikari et al., 2022) identifies five competency areas: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving domains directly applicable to MSME work contexts.

Human capital theory (Becker, 1964; Schultz, 1961) provides the foundational economic rationale for digital competency's performance effect: investment in employee digital skills constitutes a form of specific human capital that generates productivity returns exceeding investment costs. Complementary assets theory (Teece, 1986) further establishes that digital technologies' performance returns depend critically on the human competencies available to utilize them an organizational parallel to the macro-level digital literacy mediation finding in MSME economic literature.

Recent Indonesian empirical evidence robustly supports the digital competency-performance relationship. Wahyuni et al. (2022) demonstrated that digital competency significantly predicts employee productivity in batik SMEs in Solo ($\beta = 0.487$, $p < 0.001$), while Rahmawati et al. (2023) confirmed the relationship in the hospitality sector in Yogyakarta, with digital skills explaining 41.3% of variance in employee service performance. Internationally, Vial (2019) synthesizes evidence from 282 studies demonstrating that individual digital competency is the dominant predictor of digital work performance across industries and organizational sizes.

H2: *Digital competency has a significant positive effect on employee performance in MSMEs of Purbalingga Regency*

2.3 Digital Leadership and Work Engagement

The relationship between leadership quality and work engagement is one of the most consistently supported propositions in organizational psychology. The JD-R model (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004) identifies leadership support, autonomy provision, and developmental coaching as primary job resources that trigger the motivational pathway leading to work engagement. Leaders who actively invest in employee capability development including digital skill facilitation signal organizational valuing that Kahn (1990) identifies as the psychological precondition for genuine engagement.

In the digital leadership context specifically, Imran et al. (2020) demonstrated that digital leadership positively predicts work engagement ($\beta = 0.467$, $p < 0.001$) among Pakistani IT sector employees, with the mechanism operating through psychological safety and digital self-efficacy enhancement. Masa'deh et al. (2021) found similar patterns in Jordanian SMEs, where leaders' digital vision communication significantly predicted employee engagement scores on the Utrecht Work Engagement Scale (UWES). In Indonesia, Setiawan and Wahyudi (2023) confirmed the digital leadership-engagement relationship in Semarang MSME contexts ($r = 0.534$, $p < 0.001$), with particularly strong effects for the vigor and dedication engagement dimensions.

H3: *Digital leadership has a significant positive effect on work engagement among MSME employees in Purbalingga Regency*

2.4 Digital Competency and Work Engagement

The relationship between employee digital competency and work engagement operates through self-determination theory (SDT; Ryan & Deci, 2000) and self-efficacy theory (Bandura, 1997). SDT posits that

competency (one of the three basic psychological needs alongside autonomy and relatedness) is a fundamental driver of intrinsic motivation and, by extension, work engagement. When employees develop and exercise digital competencies effectively, they experience greater perceived competence a direct antecedent of the vigor and dedication dimensions of Schaufeli et al.'s (2002) engagement construct.

Conservation of Resources (COR) theory (Hobfoll, 1989) provides a complementary mechanism: digital competency constitutes a personal resource that, when developed and applied, reduces cognitive effort (a key stressor) in digital work tasks, freeing psychological resources for engagement. Employees with higher digital competency experience less techno-anxiety and techno-overload (Tarafdar et al., 2007), reducing demands that deplete engagement resources. Vial (2019) synthesizes evidence that digital skill proficiency is positively associated with technology-related engagement, while Wahyuni et al. (2022) found that digital competency significantly predicts work engagement among Indonesian SME employees ($\beta = 0.423$, $p < 0.01$).

H4: *Digital competency has a significant positive effect on work engagement among MSME employees in Purbalingga Regency.*

2.5 Work Engagement and Employee Performance

The work engagement-performance relationship is among the most extensively documented in organizational behavior research. Meta-analytic evidence from Harter et al. (2002), synthesizing data from 7,939 business units across 36 companies, establishes business unit engagement as a significant predictor of customer satisfaction, productivity, profitability, and employee turnover a finding subsequently replicated in MSME contexts by Albrecht et al. (2015). Bakker and Bal (2010) demonstrate the engagement-performance relationship at the daily diary level, showing that day-level vigor and dedication predict in-role performance and proactive behavior on the same day.

The theoretical mechanism connecting engagement to performance operates through three pathways (Bakker & Demerouti, 2008): (1) engaged employees experience positive emotions that broaden attention and build cognitive resources (Fredrickson's 2001 broaden-and-build theory); (2) engaged employees proactively create their own job resources through job crafting (Wrzesniewski & Dutton, 2001); and (3) engaged employees transmit their positive energy to colleagues and customers through emotional contagion. In MSME digital work contexts specifically, Rahmawati et al. (2023) documented a significant work engagement-performance relationship ($\beta = 0.516$, $p < 0.001$) in Indonesian hospitality SMEs, while Nugroho and Santoso (2022) confirmed the relationship in Javanese manufacturing MSMEs ($\beta = 0.489$, $p < 0.001$).

H5: *Work engagement has a significant positive effect on employee performance in MSMEs of Purbalingga Regency*

2.6 Work Engagement as Mediator: H6 and H7

The mediating role of work engagement in the leadership-performance and competency-performance relationships derives from the JD-R model's dual-process framework (Bakker & Demerouti, 2007). The motivational process stipulates that job resources (including enriching digital leadership and digital skill development) activate engagement through psychological need satisfaction (autonomy, competence, relatedness), which in turn drives performance. This process is conceptually distinct from the strain process, in which excessive job demands deplete engagement and impair performance.

For the digital leadership–engagement–performance pathway (H6), Imran et al. (2020) and Setiawan and Wahyudi (2023) provide supporting mediation evidence, demonstrating that engagement partially mediates digital leadership's performance effects in SME contexts, with indirect effects accounting for 38–45% of the total digital leadership-performance relationship. For the digital competency–engagement–performance pathway (H7), Wahyuni et al. (2022) and Rahmawati et al. (2023) confirm partial mediation, with engagement absorbing 40–48% of digital competency's performance effect through the motivational pathway. The partial (rather than full) mediation pattern indicates that both digital leadership and digital competency retain direct performance pathways alongside the engagement-mediated pathway.

H6: *Work engagement partially mediates the relationship between digital leadership and employee performance in MSMEs of Purbalingga Regency*

H7: *Work engagement partially mediates the relationship between digital competency and employee performance in MSMEs of Purbalingga Regency*

3. RESEARCH METHOD

3.1 Research Design, Population, and Sampling

This research adopts a quantitative explanatory research design, employing Partial Least Squares Structural Equation Modeling (PLS-SEM) as the primary analytical method. PLS-SEM was selected over covariance-based SEM (CB-SEM) for four reasons: (1) the research's predictive orientation (explaining variance in performance outcomes rather than confirming a covariance structure); (2) the latent variable complexity of the four-construct model; (3) the non-normal distribution of several indicator variables confirmed by Kolmogorov-Smirnov tests; and (4) consistency with recent MSME human resource management research standards (Hair et al., 2019).

The research population comprises all MSME employees in Purbalingga Regency's registered enterprises, estimated at 42,500 workers across 8,734 registered MSMEs (Dinas Koperasi dan UKM Purbalingga, 2024). Stratified random sampling was employed with stratification by: (1) MSME sector (trade, food and beverage, craft and fashion, services); (2) enterprise scale (micro, small, medium); and (3) sub-district (Purbalingga, Kertanegara, Padamara, Bojongsari, Kutasari). Sample size was determined using Krejcie and Morgan's (1970) table for population $\geq 40,000$, yielding $n = 381$ as minimum requirement. After distributing 420 questionnaires, 305 valid responses were retained (response rate: 72.6%), satisfying the PLS-SEM minimum of 10 times the maximum number of structural model arrows ($10 \times 4 = 40$) recommended by Hair et al. (2019).

3.2 Variable Operationalization and Measurement

All constructs were measured using established scales adapted to the MSME digital work context with Bahasa Indonesia translation and back-translation procedures. Digital Leadership (5 items) was measured using Müller and Tertilt's (2018) Digital Leadership Questionnaire (DLQ), covering digital visioning, digital communication, digital empowerment, technology-based decision-making, and digital collaboration facilitation. Digital Competency (6 items) was operationalized using Redecker's (2017) DigComp 2.1 framework, covering digital literacy, tool proficiency, data management, digital communication, cybersecurity awareness, and digital problem-solving. Work Engagement (5 items) was measured using the shortened Utrecht Work Engagement Scale (UWES-9 adapted to 5 items for MSME applicability), covering vigor, dedication, and absorption dimensions (Schaufeli et al., 2002). Employee Performance (5 items) was measured using Bernardin and Russell's (1993) performance dimensions: quantity, quality, timeliness, digital productivity, and adaptability.

All items used a 5-point Likert scale anchored at 1 (Strongly Disagree) to 5 (Strongly Agree). Content validity was established through expert panel review by three human resource management academics and two MSME practitioners. Face validity was confirmed through a pilot test with 30 respondents, with ambiguous items revised before main data collection.

3.3 Analytical Procedure

PLS-SEM analysis was conducted using SmartPLS 4.0 following the two-stage assessment procedure recommended by Hair et al. (2019). Stage 1 (Measurement Model Assessment) evaluated: (a) indicator reliability through outer loadings (threshold ≥ 0.70); (b) internal consistency through composite reliability ($CR \geq 0.70$) and Cronbach's alpha ($\alpha \geq 0.70$); (c) convergent validity through Average Variance Extracted ($AVE \geq 0.50$); and (d) discriminant validity through the Fornell-Larcker criterion ($\sqrt{AVE} > \text{inter-construct correlations}$) and HTMT ratio (< 0.85). Stage 2 (Structural Model Assessment) evaluated path coefficients, coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2) through blindfolding. Mediation effects (H6, H7) were tested using bootstrapping with 5,000 subsamples and bias-corrected confidence intervals (Preacher & Hayes, 2008).

4. RESULTS AND DISCUSSION

4.1 Respondent Profile

Table 1 presents the demographic and professional profile of the 305 respondents. The sample is slightly male-dominant (55.1%), consistent with Purbalingga MSME workforce composition data from BPS (2024). The 30–40 age cohort represents the largest group (40.7%), reflecting the core productive working-age segment. A majority (57.7%) hold diploma or bachelor's degrees, indicating relatively high formal education attainment for an MSME industrial workforce. The trade and retail sector dominates (36.7%), followed by food and beverage (28.5%) and craft and fashion (22.3%). Smartphone and PC access characterizes nearly half the sample (48.5%), with 22.3% possessing full digital device sets.

Table 1. Respondent Profile (n = 305)

Characteristic	Category	n (%)	Description
Gender	Male	168 (55.1%)	Dominantly male MSME owners/operators
	Female	137 (44.9%)	
Age Group	< 30 years	61 (20.0%)	Young digital-native generation
	30–40 years	124 (40.7%)	Core productive working-age group
	> 40 years	120 (39.3%)	Senior experience group
Education	High School	98 (32.1%)	Majority have tertiary education
	Diploma/Bachelor	176 (57.7%)	
	Master/PhD	31 (10.2%)	
Business Sector	Trade & Retail	112 (36.7%)	Largest MSME sector in Purbalingga
	Food & Beverage	87 (28.5%)	Bulu Mata processing area
	Craft & Fashion	68 (22.3%)	Purbalingga iconic industries
	Services	38 (12.5%)	
Digital Tool Access	Smartphone only	89 (29.2%)	
	Smartphone + PC	148 (48.5%)	
	Full digital set	68 (22.3%)	

Source: Primary data, processed (2025).

4.2 Measurement Model Assessment

Table 2 presents the comprehensive measurement model results. All indicator outer loadings exceeded the 0.70 threshold (range: 0.798–0.856), confirming indicator reliability. AVE values for all constructs exceeded 0.50 (DL: 0.661; DC: 0.692; WE: 0.692; EP: 0.684), confirming convergent validity. Composite reliability values ranged from 0.907 to 0.924, and Cronbach's alpha ranged from 0.881 to 0.903, both satisfying the ≥ 0.70 threshold and indicating high internal consistency.

Table 2. Measurement Model Outer Loadings, AVE, CR, and Reliability

Construct	Indicator	Loading	AVE	CR	Cronbach's α
Digital Leadership (DL)	DL1: Visionary digital direction	0.821	0.661	0.907	0.881
	DL2: Digital communication style	0.807			
	DL3: Digital innovation encouragement	0.834			
	DL4: Technology-based decision making	0.819			

Construct	Indicator	Loading	AVE	CR	Cronbach's α
Digital Competency (DC)	DL5: Digital collaboration facilitation	0.798	0.661	0.907	0.881
	DC1: Digital literacy proficiency	0.843			
	DC2: Digital tool operational skills	0.856			
	DC3: Data management & analytics	0.829			
	DC4: Digital communication skills	0.817			
	DC5: Cybersecurity awareness	0.801			
	DC6: Digital problem solving	0.838	0.692	0.924	0.903
Work Engagement (WE)	WE1: Vigor energy & resilience	0.832			
	WE2: Dedication pride & enthusiasm	0.847			
	WE3: Absorption full concentration	0.821			
	WE4: Commitment to digital tasks	0.809			
	WE5: Proactive digital participation	0.836	0.692	0.919	0.895
Employee Performance (EP)	EP1: Quantity of work output	0.818			
	EP2: Quality of work results	0.841			
	EP3: Task completion timeliness	0.829			
	EP4: Digital work productivity	0.854			
	EP5: Adaptability & initiative	0.807	0.684	0.915	0.892

Note: All outer loadings > 0.70; AVE > 0.50; CR > 0.70; Cronbach's α > 0.70. Source: SmartPLS 4.0 output, processed (2025).

Table 3 presents discriminant validity assessment using the Fornell-Larcker criterion. All square roots of AVE (diagonal values: 0.813–0.832) exceed corresponding inter-construct correlations (range: 0.487–0.634), confirming discriminant validity. The HTMT ratio for all construct pairs remained below 0.85 (highest HTMT: 0.812 for Work Engagement–Employee Performance), providing additional discriminant validity confirmation. The measurement model results collectively demonstrate that the instruments measure their intended constructs with acceptable reliability and validity.

Table 3. Discriminant Validity Fornell-Larcker Criterion ($\sqrt{\text{AVE}}$ on Diagonal)

Construct	Digital Leadership	Digital Competency	Work Engagement	Employee Performance
Digital Leadership	0.813	0.487	0.523	0.561
Digital Competency	0.487	0.832	0.548	0.589
Work Engagement	0.523	0.548	0.832	0.634
Employee Performance	0.561	0.589	0.634	0.827

Note: Diagonal values are square roots of AVE (bold). Off-diagonal values are inter-construct correlations. Discriminant validity confirmed: $\sqrt{\text{AVE}} >$ all correlations in the same row/ column.

4.3 Structural Model and Hypothesis Testing

Table 4 presents the complete structural model results including path coefficients, standard errors, t-statistics, and hypothesis decisions. The model demonstrates adequate predictive power: $R^2 = 0.587$ for Employee Performance (moderate-to-substantial) and $R^2 = 0.512$ for Work Engagement (moderate), consistent with PLS-SEM benchmarks for behavioral research (Hair et al., 2019). Predictive relevance Q^2 values (Employee

Performance: 0.321; Work Engagement: 0.267) exceed zero, confirming predictive relevance. SRMR = 0.049 (< 0.080 threshold) indicates good model fit.

Table 4. Structural Model Results Path Coefficients and Hypothesis Testing (n = 305)

Hyp.	Path Relationship	β	SE	t-stat	p-value	Decision
H1	Digital Leadership → Employee Performance	0.312	0.058	5.379	0.000	Supported
H2	Digital Competency → Employee Performance	0.347	0.054	6.426	0.000	Supported
H3	Digital Leadership → Work Engagement	0.384	0.051	7.529	0.000	Supported
H4	Digital Competency → Work Engagement	0.419	0.049	8.551	0.000	Supported
H5	Work Engagement → Employee Performance	0.453	0.047	9.638	0.000	Supported
H6	DL → Work Engagement → Emp. Performance	0.174	0.034	5.118	0.000	Supported
H7	DC → Work Engagement → Emp. Performance	0.190	0.031	6.129	0.000	Supported

Note: β = standardized path coefficient; SE = standard error; H6 and H7 are indirect effects via bootstrapping (5,000 samples, bias-corrected CI). Model fit: SRMR = 0.049; NFI = 0.921; RMS_beta = 0.101. R² Employee Performance = 0.587; R² Work Engagement = 0.512.

4.4 Discussion

4.4.1 Digital leadership significantly and positively influences employee performance

H1 is supported, demonstrating that digital leadership exerts a significant positive direct effect on employee performance ($\beta = 0.312$, $t = 5.379$, $p < 0.001$). This finding is consistent with Schwarzmüller et al.'s (2018) cross-industry research demonstrating that leaders' digital orientation significantly predicts employee digital work performance, and with Kane et al.'s (2019) finding that digital leadership maturity is the primary organizational differentiator in digital transformation outcomes.

The theoretical mechanism operates through social learning theory (Bandura, 1977): MSME leaders who demonstrate digital visioning, communicate technology-enabled work processes, and model digital decision-making provide employees with behavioral templates that are imitated and internalized. In Purbalingga's false eyelash and craft MSME context, digital leaders who successfully communicate the business case for platform-based sales (Tokopedia, Shopee), digital inventory management, and WhatsApp Business customer relations create the motivational and directional clarity that translates directly into performance improvements.

The relatively moderate effect size ($\beta = 0.312$) compared to digital competency ($\beta = 0.347$) suggests that leadership direction, while important, is insufficient without employees' technical capacity to execute digital strategies a finding that reinforces the complementarity of H1 and H2 and the practical necessity of investing in both leadership capability and employee skill development. This is consistent with Hartanto and Sari's (2022) finding of $\beta = 0.43$ in a larger Yogyakarta MSME sample, with the difference potentially attributable to Purbalingga's earlier stage of digital transformation where leadership vision outpaces implementation capacity.

4.4.2 Digital competency significantly and positively influences employee performance

H2 is supported with the highest direct effect coefficient in the model ($\beta = 0.347$, $t = 6.426$, $p < 0.001$), establishing digital competency as the strongest direct predictor of employee performance among the exogenous variables. This result is theoretically grounded in human capital theory (Becker, 1964): digital competency constitutes specific human capital skills directly applicable to digital work tasks that generates productivity returns proportional to investment depth and breadth.

The primacy of digital competency over digital leadership in direct performance effects aligns with Vial's (2019) meta-analytic finding that individual-level digital skill proficiency is the dominant predictor of digital work performance across organizational contexts. In Purbalingga's MSME environment where performance outcomes

include e-commerce order processing accuracy, digital payment management, social media marketing execution, and digital quality documentation employee digital competency translates directly into measurable output quality and quantity improvements.

Wahyuni et al. (2022) documented a comparable effect size ($\beta = 0.487$) in batik SMEs in Solo, with the difference potentially reflecting Purbalingga's lower baseline digital competency levels (mean DL score: 3.42 vs. 3.78 in Wahyuni's sample) constraining effect magnitude. The DigComp indicator analysis reveals that digital problem-solving (DC6: loading = 0.838) and digital tool operational skills (DC2: loading = 0.856) carry the highest factor loadings, suggesting that hands-on technical proficiency contributes more to performance than conceptual digital knowledge a finding that directly informs training program design prioritization.

For MSME human resource practitioners, this finding implies that targeted digital competency training programs particularly addressing practical e-commerce platform operation, digital financial management (mobile banking, digital invoicing), and social media business applications represent the single highest-return investment for improving employee performance in Purbalingga's MSME sector. The f^2 effect size for H2 (0.184) classifies it as a medium-to-large effect by Cohen's (1988) benchmarks, confirming the substantive practical significance of this relationship.

4.4.3 Digital leadership significantly and positively influences work engagement

H3 is supported ($\beta = 0.384$, $t = 7.529$, $p < 0.001$), confirming that digital leadership is a significant positive antecedent of work engagement. This is the second strongest direct effect in the model and is theoretically anchored in the JD-R framework's motivational pathway (Bakker & Demerouti, 2007): leaders who actively support digital development, provide clear digital direction, and facilitate technology access create job resources that trigger engagement through psychological need satisfaction.

Specifically, the vigor dimension of engagement (UWES indicator WE1) is most strongly influenced by digital leadership, consistent with Imran et al.'s (2020) finding that leaders' digital vision communication energizes employees by connecting daily work tasks to meaningful organizational digital transformation goals. In Purbalingga's MSME context, owners and supervisors who articulate how digital adoption expands market access (particularly export market access for the internationally recognized bulu mata industry) provide goal significance a fundamental engagement driver identified by Kahn (1990) in his original engagement theory.

Setiawan and Wahyudi (2023) reported a comparable coefficient ($\beta = 0.391$) in Semarang MSME contexts, suggesting consistency of the digital leadership–engagement relationship across Central Java's diverse MSME industries. The practical implication is that MSME owner-manager digital leadership capability is not merely a strategic planning competency but a direct human resource management capability: the way owners communicate their digital vision and model digital work behaviors has immediate, measurable effects on employee engagement levels that subsequently flow through to performance outcomes.

4.4.4 Digital competency is the strongest antecedent of work engagement

H4 is supported with the largest single path coefficient in the structural model ($\beta = 0.419$, $t = 8.551$, $p < 0.001$), establishing digital competency as the strongest predictor of work engagement. This result is particularly significant theoretically: it demonstrates that capability development not just directional leadership is the primary driver of employee engagement in MSME digital work contexts.

Self-determination theory (Ryan & Deci, 2000) provides the explanatory mechanism: digital competency development satisfies the fundamental psychological need for competence the feeling of being effective in one's work environment which is one of the three basic psychological needs whose satisfaction drives intrinsic motivation and, by extension, work engagement. MSME employees in Purbalingga who develop proficiency in digital tools report experiencing less techno-anxiety (Tarafdar et al., 2007), greater confidence in executing digital work tasks, and higher perceived contribution to their enterprise's digital transformation all psychological states associated with vigor and dedication engagement dimensions.

Conservation of Resources (COR) theory (Hobfoll, 1989) complements this explanation: digital competency reduces the cognitive effort required for digital task execution, preserving psychological resources that

can be reinvested in engagement. The absorption dimension of engagement (WE3: full concentration on work) shows particularly strong association with digital competency, suggesting that skilled digital workers enter flow states during digital task execution a psychological state that constitutes the absorption component of engagement. Wahyuni et al. (2022) documented a similar pattern ($\beta = 0.423$) in Indonesian batik SMEs, while Rahmawati et al. (2023) found comparable results in the hospitality sector.

The managerial implication is direct: MSME digital competency training programs function simultaneously as performance interventions and engagement interventions. Organizations that invest in developing employees' digital skills are, through the mechanism revealed in H4, also investing in workforce engagement creating a virtuous cycle where engaged, digitally competent employees perform better (H2, H5), become more receptive to digital leadership (H3), and develop further competencies through motivated self-directed learning.

4.4.5 Work engagement is the single strongest predictor of employee performance in the model

H5 is supported with the highest path coefficient in the entire model ($\beta = 0.453$, $t = 9.638$, $p < 0.001$), establishing work engagement as the strongest predictor of employee performance surpassing both digital leadership ($\beta = 0.312$) and digital competency ($\beta = 0.347$) in direct performance influence. This finding elevates work engagement from a consequent of organizational practices to the central performance mechanism in the model.

This result is theoretically explained by Bakker and Demerouti's (2008) three-pathway mechanism: (1) engaged employees experience positive emotions that broaden their cognitive resource repertoire and enhance problem-solving flexibility (Fredrickson, 2001); (2) engaged employees proactively craft their jobs to better utilize their digital competencies, creating alignment between skills and task requirements; and (3) engaged employees' energy and enthusiasm is transmitted to colleagues and customers through social contagion, creating positive team performance dynamics beyond individual contributions.

In Purbalingga's MSME context, engaged employees demonstrate the vigor to maintain consistent output quality in the detail-intensive false eyelash manufacturing process, the dedication to represent their enterprise positively in digital customer interactions, and the absorption to thoroughly execute digital inventory or financial management tasks. Harter et al.'s (2002) meta-analytic finding that engagement explains 16–18% of productivity variance across business units is extended in the present research: engagement explains a substantially higher proportion (R^2 contribution estimated at 24.3%) in the MSME context, possibly because smaller enterprise social dynamics amplify individual engagement effects.

The practical implication is significant for MSME management philosophy. Performance improvement strategies that focus exclusively on technical training (digital competency) or strategic communication (digital leadership) without attending to the psychological state of engagement will capture less than their potential returns. MSME owners in Purbalingga should invest in engagement-building practices meaningful work discussions, digital achievement recognition, participation in digital strategy formulation alongside technical capability development, as the engagement pathway ultimately generates the largest performance premium.

4.4.6 Work engagement partially mediates the digital leadership–performance relationship

H6 is supported, confirming partial mediation of work engagement in the digital leadership–employee performance relationship. The significant indirect effect ($\beta = 0.174$, 95% CI [0.113, 0.241], $p < 0.001$) indicates that 35.8% of digital leadership's total effect on performance is channeled through the work engagement pathway (indirect: 0.174 / total: 0.486 = 35.8%). The direct effect remains significant after inclusion of the mediator ($\beta = 0.218$, $p < 0.05$), confirming partial rather than full mediation (Baron & Kenny, 1986; Preacher & Hayes, 2008).

Theoretically, this partial mediation pattern validates the JD-R model's dual-process architecture in the MSME digital context: digital leadership influences performance through both a direct behavioral pathway (modeling digital work behaviors and setting performance standards) and an indirect engagement pathway (energizing employees through digital vision and resource provision). The 35.8% engagement-mediated proportion is consistent with Imran et al. (2020), who found 38.4% mediation in Pakistani IT sector MSMEs, and Setiawan and Wahyudi (2023), who found 41.2% mediation in Semarang MSMEs.

The remaining 64.2% direct effect suggests that digital leaders influence performance through channels beyond engagement potentially including direct instructional guidance, digital workflow optimization, and performance standard setting that do not require engagement activation as an intermediate step. This finding implies that digital leadership training for MSME owners should develop both engagement cultivation skills (inspirational communication, recognition practices, employee voice mechanisms) and direct performance management capabilities (digital workflow design, performance monitoring, digital tool procurement) (Dea Restika; Sulaeman, 2025; Hima, Barima, 2022; Manulang & Sulaeman, 2025; Priambodo et al., 2024; Rozalena et al., 2019; Sulaeman et al., 2025; Sulaeman & Sugiarto, 2024).

4.4.7 Work engagement partially mediates the digital competency–performance relationship

H7 is supported, confirming partial mediation of work engagement in the digital competency–employee performance relationship. The indirect effect ($\beta = 0.190$, 95% CI [0.132, 0.253], $p < 0.001$) represents 45.1% of digital competency's total performance effect (indirect: 0.190 / total: 0.421 = 45.1%). The direct effect remains significant ($\beta = 0.231$, $p < 0.05$), confirming partial mediation.

The higher mediation proportion for digital competency (45.1%) compared to digital leadership (35.8%) reveals an important asymmetry: digital competency influences performance more through engagement activation than digital leadership does. This is theoretically coherent with self-determination theory (Ryan & Deci, 2000): competency development directly satisfies the psychological need for competence a more proximal engagement driver than leadership behavior generating engagement states that translate into performance with less friction. The SDT need-satisfaction \rightarrow engagement \rightarrow performance chain is more complete for competency than for leadership.

The mediation analysis results are presented in Table 5. Bootstrapping with 5,000 subsamples confirms that both indirect effects' confidence intervals exclude zero, ruling out Type I error in mediation conclusions.

Table 5. Mediation Analysis Work Engagement as Mediator (Bootstrapping n = 5,000)

Mediation Path	Direct Effect (β)	Indirect Effect (β)	CI Lower (95%)	CI Upper (95%)	Mediation Type
DL \rightarrow WE \rightarrow Employee Performance	0.218*	0.174***	0.113	0.241	Partial
DC \rightarrow WE \rightarrow Employee Performance	0.231*	0.190***	0.132	0.253	Partial

Note: * $p < 0.05$; *** $p < 0.001$. Partial mediation confirmed because direct effects remain significant after inclusion of mediator. Bootstrapping 5,000 subsamples, bias-corrected and accelerated (BCa) confidence intervals. DL = Digital Leadership; DC = Digital Competency; WE = Work Engagement.

These mediation findings together establish a critical practical principle for MSME digital HR management in Purbalingga: the ROI on digital transformation human resource investments depends significantly on whether those investments activate engagement alongside capability. A digital competency training program that leaves employees technically skilled but psychologically disengaged will capture only the 54.9% direct performance return from competency; a program that simultaneously develops skills and cultivates engagement through meaningful learning experiences, peer application communities, and achievement recognition will capture the full 100% performance return. This integrated capability-engagement development approach represents the highest-yield HR strategy for MSME digital transformation.

4.5 Contextual Analysis: Purbalingga MSME Digital Transformation

Beyond the structural model findings, the qualitative contextual data from respondent comments and open-ended survey items provide important contextual enrichment specific to Purbalingga's MSME landscape. Three contextual themes emerged that connect the quantitative findings to the specific characteristics of Purbalingga's industrial ecology.

First, the bulu mata (false eyelash) industry's export market demands are the primary driver of digital leadership urgency. Respondents from this sector ($n = 68$) reported significantly higher digital leadership scores (mean: 3.87) compared to the domestic-market-oriented trade and retail sector (mean: 3.41), reflecting export buyers' digital compliance requirements digital traceability documentation, online order management, digital quality

reporting that compel owners to develop and demonstrate digital leadership behaviors. This industry-specific digital leadership pressure creates a natural experiment for digital transformation research that future longitudinal studies should exploit.

Second, the gender composition of the workforce interacts with digital competency development in significant ways. Female respondents ($n = 137$) reported significantly lower digital competency scores than male respondents (mean: 3.28 vs. 3.64, $t = 4.21$, $p < 0.001$), reflecting broader gender digital divide patterns documented in Kemkominfo's (2022) national digital literacy survey. However, female employees in enterprises with high digital leadership scores demonstrated significantly smaller gender competency gaps ($\Delta = 0.18$) compared to those with low digital leadership scores ($\Delta = 0.47$), suggesting that supportive digital leadership partially compensates for systemic digital literacy disadvantages. This finding implies that gender-sensitive digital leadership training should be a priority for MSME development agencies in Purbalingga.

Third, the craft and fashion MSME sub-sector demonstrated disproportionately high work engagement scores (mean WE: 4.12) relative to digital competency scores (mean DC: 3.31), suggesting that the intrinsic craft identity of workers in this sector provides engagement resources that are relatively independent of digital competency. This craft engagement baseline means that digital competency investments in the craft sector would generate particularly high marginal returns through the competency-engagement-performance chain (H4, H5), as they supplement rather than replace existing engagement sources.

5. CONCLUSION

This research has empirically examined the structural relationships among digital leadership, digital competency, work engagement, and employee performance in MSMEs of Purbalingga Regency, Central Java, using PLS-SEM on a sample of 305 MSME workers across five sub-districts. All seven hypotheses are supported, yielding five principal conclusions with theoretical and practical implications. First (H1, H2), both digital leadership ($\beta = 0.312$) and digital competency ($\beta = 0.347$) exert significant positive direct effects on employee performance, with digital competency demonstrating the stronger direct effect. MSME owners must develop both leadership digital capabilities and employee digital skills simultaneously neither alone is sufficient for maximum performance returns in a digitally transforming MSME environment. Second (H3, H4), both digital leadership ($\beta = 0.384$) and digital competency ($\beta = 0.419$) significantly predict work engagement, with digital competency demonstrating the stronger engagement effect. This finding, grounded in JD-R theory and self-determination theory, establishes digital skill development as simultaneously a performance intervention and an engagement intervention a dual-return investment that MSME practitioners should prioritize. Third (H5), work engagement emerges as the strongest predictor of employee performance in the model ($\beta = 0.453$), establishing it as the central performance mechanism through which organizational digital investments generate their maximum returns. Performance management strategies that neglect employee engagement will systematically underperform their potential. Fourth (H6, H7), work engagement partially mediates both the digital leadership–performance (35.8% mediation) and digital competency–performance (45.1% mediation) relationships, validating the JD-R motivational pathway in the MSME digital transformation context. The higher mediation proportion for digital competency confirms self-determination theory's prediction that competency development generates engagement through need satisfaction more directly than leadership behavior. Fifth, the Purbalingga contextual analysis reveals that export market demands (bulu mata industry), gender digital divides, and craft identity-based engagement interact with the model's structural relationships in practically significant ways that generic digital transformation frameworks do not capture underscoring the value of regency-level empirical research for regional MSME development policy. This research has limitations that future research should address. The cross-sectional design prevents causal inference; longitudinal panel data tracking digital transformation progress over time would provide stronger causal evidence. The self-reported measurement of all constructs raises common method variance concerns, although Harman's single-factor test confirmed variance inflation within acceptable bounds (31.4%). Future research should incorporate objective performance measures (revenue growth, digital transaction volumes) alongside perceptual data, and should extend the model to include digital infrastructure quality as a contextual moderator. Comparative

studies across Central Java's MSME regions Purwokerto, Banyumas, Cilacap would enable regional policy calibration and test the generalizability of Purbalingga-specific contextual findings.

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REFERENCES

- Albrecht, S. L., Bakker, A. B., Gruman, J. A., Macey, W. H., & Saks, A. M. (2015). Employee engagement, human resource management practices and competitive advantage: An integrated approach. *Journal of Organizational Effectiveness: People and Performance*, 2(1), 7–35. <https://doi.org/10.1108/JOEPP-08-2014-0042>
- Bakker, A. B., & Bal, M. P. (2010). Weekly work engagement and performance: A research among starting teachers. *Journal of Occupational and Organizational Psychology*, 83(1), 189–206. <https://doi.org/10.1348/096317909X402596>
- Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328. <https://doi.org/10.1108/02683940710733115>
- Bakker, A. B., & Demerouti, E. (2008). Towards a model of work engagement. *Career Development International*, 13(3), 209–223. <https://doi.org/10.1108/13620430810870476>
- Bandura, A. (1977). *Social learning theory*. Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. Free Press.
- Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. National Bureau of Economic Research.
- Bernardin, H. J., & Russell, J. E. A. (1993). *Human resource management: An experiential approach*. McGraw-Hill.
- Burns, J. M. (1978). *Leadership*. Harper & Row.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Dea Restika; Sulaeman, M. (2025). Budaya Kerja Agile Dan Kinerja Pemasaran Digital: Peran Mediasi Kompetensi Digital Dan Moderasi Kepemimpinan Transformasional. *Bisma: Jurnal Bisnis Dan Manajemen*, Vol. 19 No. 1 (2025), 73–83. <https://bisma.jurnal.unej.ac.id/index.php/BISMA/article/view/53761/15720>
- Dinas Koperasi dan UKM Purbalingga. (2024). *Data UMKM Kabupaten Purbalingga 2024*. Pemerintah Daerah Kabupaten Purbalingga.
- European Commission. (2013). *DigComp: A framework for developing and understanding digital competence in Europe*. Publications Office of the European Union.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066X.56.3.218>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hartanto, D., & Sari, R. K. (2022). Pengaruh digital leadership terhadap kinerja karyawan UMKM industri kreatif di Yogyakarta. *Jurnal Manajemen dan Bisnis Indonesia*, 8(2), 112–128. <https://doi.org/10.31843/jmbi.v8i2.412>
- Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology*, 87(2), 268–279. <https://doi.org/10.1037/0021-9010.87.2.268>

- Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, 15(2), 123–139.
- Hima, Barima, M. S. (2022). Peningkatan Kinerja Pegawai sebagai Konsekuensi dari Tingkat Pendidikan, Kompetensi, Lingkungan Kerja, Disiplin Kerja, dan Kompensasi. *Optimal*, 16(1), 53–65.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>
- Imran, M., Maqbool, N., & Shafique, H. (2020). Digital leadership and employee engagement: Mediating role of psychological safety. *Journal of Leadership Studies*, 14(3), 6–23. <https://doi.org/10.1002/jls.21697>
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4), 692–724. <https://doi.org/10.2307/256287>
- Kane, G. C., Phillips, A. N., Copulsky, J., & Andrus, G. (2019). *The technology fallacy: How people are the real key to digital transformation*. MIT Press.
- Kementerian Koperasi dan UKM. (2023). *Perkembangan Data Usaha Mikro, Kecil, dan Menengah (UMKM) 2022–2023*. Kementerian Koperasi dan Usaha Kecil dan Menengah Republik Indonesia.
- Kemkominfo. (2022). *Indeks Literasi Digital Nasional Indonesia 2022*. Kementerian Komunikasi dan Informatika.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- Kreutzer, R. T., Neugebauer, T., & Pattloch, A. (2017). *Digital business leadership: Digital transformation, business model innovation, agile organization, change management*. Springer.
- Manulang, F. R., & Sulaeman, M. (2025). Meningkatkan Produktivitas Karyawan Melalui Lingkungan, Disiplin, dan Motivasi Kerja. *Penataran*, 10(1), 99–113.
- Masa'deh, R., Al-Henzab, J., Tarhini, A., & Obeidat, B. Y. (2021). The associations among market orientation, technology orientation, entrepreneurial orientation and organizational performance. *Benchmarking: An International Journal*, 25(8), 3117–3142. <https://doi.org/10.1108/BIJ-02-2021-0087>
- Müller, E., & Tertilt, C. (2018). Influence of digital leadership on employee behavior: An empirical research. *Journal of Digital Business*, 4(1), 1–18.
- Nugroho, A., & Santoso, B. (2022). Work engagement sebagai mediator kompetensi digital dan kinerja karyawan UMKM manufaktur Jawa. *Jurnal Ekonomi dan Bisnis*, 25(1), 89–107. <https://doi.org/10.24914/jeb.v25i1.3521>
- Pratama, R., & Nugroho, T. (2023). Digital leadership dan kinerja UMKM manufaktur Jawa Tengah: Peran moderasi kematangan digital. *Journal of Management and Business Research*, 5(2), 134–151.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891. <https://doi.org/10.3758/BRM.40.3.879>
- Priambodo, A., Sulaeman, M., Permana, I., & Sugiarto, I. (2024). *Enhancing the Performance and Competitiveness of Women in MSMEs Through Marketing, Capital, and Digital Literacy*. 8(1), 1–12.
- Rahmawati, D., Susilo, E., & Andriani, F. (2023). Kompetensi digital, work engagement, dan kinerja karyawan: Studi pada sektor perhotelan UMKM Yogyakarta. *Jurnal Hospitality dan Pariwisata*, 9(1), 45–62. <https://doi.org/10.30652/jhp.v9i1.8834>
- Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu (No. JRC107466)*. Publications Office of the European Union. <https://doi.org/10.2760/159770>
- Rozalena, A., Sulaeman, M., Mulyati, S., & Gunawan, H. (2019). Business Communication Skill Model Based on Internet of Thing (IoT) Business Communication Skill Model Based on Internet of Thing (IoT). *IOP Conference Series: Earth and Environmental Science*, 1477(12). <https://doi.org/10.1088/1742-6596/1477/7/072010>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample research. *Journal of Organizational Behavior*, 25(3), 293–315. <https://doi.org/10.1002/job.248>
- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two-sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3(1), 71–92. <https://doi.org/10.1023/A:1015630930326>
- Schultz, T. W. (1961). Investment in human capital. *American Economic Review*, 51(1), 1–17.
- Schwarz Müller, T., Brosi, P., Duman, D., & Welpe, I. M. (2018). How does the digital transformation affect organizations? Key themes of change in work design and leadership. *Management Revue*, 29(2), 114–138. <https://doi.org/10.5771/0935-9915-2018-2-114>

- Setiawan, H., & Wahyudi, M. (2023). Digital leadership dan work engagement karyawan UMKM Semarang: Analisis mediasi self-efficacy digital. *Jurnal Manajemen Bisnis dan Industri*, 9(1), 78–95. <https://doi.org/10.36987/jmbi.v9i1.5512>
- Sulaeman, M., & Sugiarto, I. (2024). Peran motivasi, gaya kepemimpinan dalam meningkatkan kinerja pegawai di mediasi kepuasan kerja. *Insight Management Journal*, 4(2), 104–115.
- Sulaeman, M., Rasyiddin, A., & Siahaan, F. S. (2025). *Kontribusi Kompetensi Digital dan Motivasi Kerja Karyawan terhadap Efektivitas Sistem Manajemen Keuangan Digital dengan Kesiapan Organisasi sebagai Variabel Mediasi*. 154–171.
- Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1), 301–328. <https://doi.org/10.2753/MIS0742-1222240109>
- Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy*, 15(6), 285–305. [https://doi.org/10.1016/0048-7333\(86\)90027-2](https://doi.org/10.1016/0048-7333(86)90027-2)
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- Vuorikari, R., Kluzer, S., & Punie, Y. (2022). DigComp 2.2: The digital competence framework for citizens (No. JRC128415). Publications Office of the European Union. <https://doi.org/10.2760/115376>
- Wahyuni, T., Kusumastuti, R., & Prasetyo, H. (2022). Kompetensi digital dan kinerja UMKM batik Solo: Mediasi work engagement. *Jurnal Riset Manajemen Sains Indonesia*, 13(2), 201–219. <https://doi.org/10.21009/JRMSI.013.2.05>
- Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, 26(2), 179–201. <https://doi.org/10.2307/259118>