

Adaptive Performance as a Pathway to Human Capital Readiness: The Roles of Digital Readiness and Organizational Resilience

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Abstract

This study examines how learning agility and change self-efficacy are associated with human capital readiness through adaptive performance and whether digital readiness and organizational resilience condition these relationships. Using a quantitative explanatory design, cross-sectional survey data from 350 professional workers across government, state-owned enterprises, banking, higher education, and digital-based private organizations in South Kalimantan, Indonesia, were analyzed with Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. Learning agility ($\beta = 0.186$, $p = 0.004$) and change self-efficacy ($\beta = 0.301$, $p < 0.001$) were positively associated with adaptive performance, while adaptive performance was positively associated with human capital readiness ($\beta = 0.498$, $p < 0.001$). The model explained 74.6% of the variance in adaptive performance and 73.4% in human capital readiness. Digital readiness did not significantly moderate either capability-performance relationship. Organizational resilience strengthened the learning agility-adaptive performance relationship ($\beta = 0.135$, $p = 0.010$) but weakened the change self-efficacy-adaptive performance relationship ($\beta = -0.196$, $p = 0.016$). These findings position adaptive performance as a central behavioral pathway through which individual capabilities relate to workforce readiness and show that organizational context operates asymmetrically rather than uniformly. Organizations should pair digital investment with learning-oriented work design, confidence-building support, managerial flexibility, and knowledge-sharing mechanisms.

JEL Classification: J24; M12; M15; O33

1 Introduction

Industry 5.0 has placed artificial intelligence and automation at the center of changing work and organizational systems. Technologies such as big data analytics, the Internet of Things, and cyber-physical systems have increased the demand for agile, responsive, and real-time decision making (Cosa 2024). Digitalization also disrupts established work patterns and requires organizations to rebuild workforce capabilities for technological change (Wanasinghe et al. 2024). Unlike earlier automation-oriented models, Industry 5.0 emphasizes human-machine collaboration, productivity, innovation, sustainability, and resilience. The Adaptive Social Manufacturing framework identifies digital readiness, workforce competence, and strategic organizational capability as foundations for navigating cyber-physical complexity (Ghobakhloo et al. 2026), while digital capabilities support the transition from Industry 4.0 to 5.0 (Kans and Campos 2024). Human resource readiness, individual adaptability, and organizational resilience are therefore central to sustainable digital transformation (Ali et al. 2025; Islam et al. 2025).

Digital transformation increasingly affects public agencies, state-owned enterprises, banking, and higher education through demands for service efficiency, transparency, and competitiveness. Technology adoption is influenced by performance expectancy, facilitating conditions, and social influence (Lampropoulos 2024), yet many institutions still lack sufficient digital competence and organizational readiness (Mantel-teeuwisse et al. 2021). Employee participation can shape both operational efficiency

and longer-term transformation readiness (Abhari 2025). In South Kalimantan, differences in infrastructure and individual capability complicate digitalization across public services, state-owned enterprises, and universities. Workforce adaptability depends on responsiveness and the capacity to anticipate changing job requirements (Saefullah et al. 2024). Although learning agility supports innovative behavior and performance in Indonesian organizations (Saiyed et al. 2025), limited digital ecosystems may constrain its practical expression. Readiness also does not arise from self-efficacy alone; TPACK-based dynamic capabilities can mediate the translation of confidence into digital teaching readiness (Krisnaresanti et al. 2026).

Human capital readiness is a strategic condition for organizations transitioning toward digitally intelligent work systems. Automation replaces some traditional tasks while creating new roles that require higher-order competence (Wanasinghe et al. 2024). Workforce capability may even outweigh technological infrastructure in determining smart manufacturing readiness (Dwivedy et al. 2025). Organizational, behavioral, and technological factors jointly shape readiness, with competence development, top-management support, and digital culture among the most influential elements (Gupta et al. 2022). Digital competence also includes collaboration, problem solving, virtual teamwork, and flexibility, not merely technical proficiency (Murawski and Bick 2017). Readiness therefore requires continuous capability development rather than episodic technical training (Krisnaresanti et al. 2026). Adaptive performance complements this readiness by enabling employees to maintain effectiveness under changing conditions. It predicts organizational performance beyond technical competence (Fatima et al. 2020), is strengthened by supportive work systems and positive perceptions of change (Narbariya 2022), and contributes to operational continuity when combined with organizational agility and resilience (Ivanov 2022).

Two psychological capabilities are especially relevant to adaptive performance. Learning agility supports rapid learning from experience and effective responses to unfamiliar challenges (Salih et al. 2025), and employees with higher learning agility tend to display more innovative work behavior (Wolor et al. 2025). Change self-efficacy reflects confidence in managing organizational change and is conceptually related to perceived behavioral control in the Theory of Planned Behavior (Ajzen 2020). Self-efficacy also influences attitudes and intentions toward the use of artificial intelligence (Darayseh 2023). Whether these capabilities translate into adaptive behavior depends partly on organizational conditions. Digital readiness includes infrastructure, competence, and systems that enable proactive responses to change (Wanasinghe et al. 2024), although resource-constrained organizations may still face integration and investment barriers (Dwivedy et al. 2025). Digital literacy functions as an organizational affordance (Cetindamar Kozanoglu and Abedin 2021), while digital capability and orientation support innovation and performance (Khin and Ho 2019). Organizational resilience similarly depends on transformation management, shared learning, agility, and the capacity to absorb and adapt to disruption (He 2021; Ivanov 2022; Kantabutra 2021; Holley et al. 2022).

Despite the rapid growth of literature on digital transformation, human capital, and organizational resilience, systematic gaps continue to constrain a comprehensive understanding of how these

capabilities interact. First, most studies treat psychological capability, adaptive capability, and digital capability dichotomously and therefore fail to capture the interactional dynamics among them (Lampropoulos 2024; Saiyed et al. 2025). Second, the majority focus on employee performance or technology adoption as a single dependent variable without examining the simultaneous contribution of learning agility, change self-efficacy, and adaptive performance to the formation of comprehensive human capital readiness (Fatima et al. 2020; Wolor et al. 2025). Third, the simultaneous testing of digital readiness and organizational resilience as moderators within a single empirical model remains rare, even though both are critical contextual determinants of the effectiveness of individual capabilities (Ghobakhloo et al. 2026; He 2021). Fourth, research positioning civil servants, state-owned enterprise employees, and university teaching staff in South Kalimantan as its object of study remains limited, so the generalization of global findings to local contexts with different infrastructure and digital capability characteristics requires empirical testing (Krisnaresanti et al. 2026; Mantel-teeuwisse et al. 2021). Collectively, these gaps underscore the urgency of developing an integrative model capable of explaining the formation of human capital readiness holistically within multi-sector digital transformation.

This study develops a "Future Workforce Readiness" model integrating individual capability (learning agility and change self-efficacy), adaptive capability (adaptive performance), and organizational context (digital readiness and organizational resilience). The model extends research in human resource management, organizational behavior, and digital transformation by examining how psychological capabilities are converted into human capital readiness through adaptive performance. It also tests digital readiness and organizational resilience simultaneously as contextual moderators. Empirically, the study provides evidence from a multi-sector workforce in South Kalimantan and offers practical guidance for public organizations, state-owned enterprises, banking, higher education, and digital-based private organizations seeking to build an adaptive and resilient workforce (Cosa 2024; Ghobakhloo et al. 2026; Dwivedy et al. 2025; Wanasinghe et al. 2024).

2 Literature review

2.1 Learning Agility and Adaptive Performance

Learning agility is the capacity to learn from experience, apply knowledge in unfamiliar situations, and adjust to changing work demands (Wea 2023). It reflects cognitive flexibility and learning readiness under uncertainty (Tripathi and Kalia 2024), making it relevant to employees who must adopt evolving digital systems. Empirical studies show that learning agility contributes to lecturers' adaptive performance in VUCA conditions (Wea 2023), can strengthen the relationship between digital resilience and adaptive performance (Mahar et al. 2025), and operates through active learning in the relationship between work engagement and adaptive performance (Nandini and Gustomo 2022). It is also developable: training and organizational flexibility enhance learning agility and employee agility (Nurmiyati et al. 2026), while organizational learning supports proactive and adaptive behavior through psychological empowerment (Putri and Mangundjaya 2020). In digital workplaces, continuous learning,

knowledge sharing, and responsiveness to technological change are therefore central to successful transformation (Muduli and Choudhury 2024).

Learning agility can improve adaptive performance through four mechanisms. It supports cognitive flexibility in processing new information (Rahmawati et al. 2025), facilitates experiential learning and adjustment after mistakes (Park et al. 2022), strengthens the mental agility needed in ambiguous digital work (Vinesian and Sari 2023), and encourages proactive competency development before new demands emerge (Coetzee et al. 2020). These mechanisms are increasingly important under Industry 5.0, where employees must combine technical ability with creativity, critical thinking, and collaborative problem solving (Erceg et al. 2020). Learning agility therefore functions as a meta-competency that helps individuals recognize patterns, transfer lessons across situations, and respond adaptively to changing organizational demands. Accordingly, the first hypothesis is formulated as follows:

H1: Learning Agility is positively associated with Adaptive Performance.

2.2 Change Self-Efficacy and Adaptive Performance

Change self-efficacy is an individual's belief in their capacity to manage and contribute positively to organizational change, particularly during digital transformation (Wortmann and Jauer 2024). Drawing on self-efficacy theory, such beliefs shape effort, persistence, and performance (Adam and Hanafi 2022). Employees with high change self-efficacy are more likely to interpret change as a manageable challenge rather than a threat. The construct also aligns with perceived behavioral control in the Theory of Planned Behavior (Hagger and Hamilton 2025), and self-efficacy has been shown to influence attitudes, perceived control, and intention in flexible learning implementation (Costan et al. 2022). Empirical evidence further links change-related self-efficacy with change engagement and proactive behavior (Albrecht et al. 2023), performance through readiness to change (Khusna and Pratiwi 2022), and effective performance under altered work arrangements (Schoch 2023).

From a Conservation of Resources perspective, self-efficacy is a personal resource that supports cognitive, emotional, and behavioral responses to organizational change (Deviana and Hendarsjah 2023). Employees with stronger efficacy beliefs can invest effort in adaptive behavior without excessive resource depletion and tend to display more constructive attitudes toward change (Kidane 2022). This capability can also be strengthened through organizational intervention. Two-way communication and supportive interaction reinforce confidence during remote and digitally mediated work (Darmawan and Lussak 2022). Under Industry 5.0, where change involves new mindsets and forms of human-machine collaboration, self-efficacy, optimism, and resilience become important psychological resources for adaptive performance (Hassian et al. 2022). Change self-efficacy is therefore expected to improve appraisal of change, emotional regulation, persistence, feedback seeking, and knowledge sharing. Accordingly, the second hypothesis is formulated as follows:

H2: Change Self-Efficacy is positively associated with Adaptive Performance.

2.3 Adaptive Performance and Human Capital Readiness

Adaptive performance is the capacity to adjust work behavior to changing conditions, task demands, and organizational environments (Trenerry et al. 2021). Human capital readiness refers to employees' preparedness for digital work through technical competence, cognitive skills, adaptability, and continuous-learning orientation (Farlis et al. 2025). Human capital theory holds that knowledge, skills, and abilities increase individual productivity and organizational value (Khaerunnisa et al. 2026). Adaptive performance represents the practical deployment of that capital because employees must apply competence under changing conditions. Evidence indicates that employee agility predicts performance in the digital transformation era (Khaerunnisa et al. 2026), while both cognitive and non-cognitive skills contribute to productivity as work becomes less routine (Morandini et al. 2020). In an Indonesian regional context, adaptability was also identified as a meaningful component of human capital readiness for digital transformation (Farlis et al. 2025).

Adaptive performance can strengthen human capital readiness in several ways. It supports employability and career resilience in labor markets shaped by digitalization and lifelong learning (Wymann et al. 2021). It facilitates continuous learning, digital literacy, problem solving, and virtual collaboration (Ardiramadan and Turyandi 2026). It also assists technology adoption when employees perceive their work as meaningful and act proactively (Hamid 2022). As a meta-competency, adaptive performance helps individuals integrate specialized, methodological, social, and personal capabilities required for Industry 4.0 and 5.0 (Sony and Mekoth 2022; Oosthuizen 2022). It strengthens cognitive flexibility, stress management, and collaboration in digitally mediated work (Marku et al. 2024; Kapkaev and Rudenko 2021; Gorski et al. 2022). These capabilities are important because human-centered digital transformation creates new opportunities while requiring continuous skill renewal and effective human-machine collaboration (Balog et al. 2021). Accordingly, the third hypothesis is formulated as follows:

H3: Adaptive Performance is positively associated with Human Capital Readiness.

2.4 Digital Readiness as a Moderating Variable

Digital readiness is an organization's preparedness to adopt, integrate, and use digital technology through infrastructure, employee competence, digital culture, and transformation strategy (Nkomo and Kalisz 2026). From a contingency perspective, the effect of individual characteristics on performance depends on their fit with the organizational context; digital readiness may therefore condition whether learning agility becomes adaptive performance (Sharma et al. 2024). In digitally ready organizations, employees have greater access to learning platforms, real-time information, and collaborative tools (Dyah et al. 2025). Such organizations are also more likely to support experimentation, knowledge sharing, and learning from failure (Nkomo and Kalisz 2026; Klein et al. 2024). Adequate infrastructure, agile decision making, and digital literacy can reduce barriers to implementing new knowledge (Rotem 2022). Conversely, limited infrastructure, support, or digital culture may prevent agile learners from translating their capabilities into adaptive work behavior.

Digital readiness may also condition the relationship between change self-efficacy and adaptive performance. Structural support can reduce uncertainty and technical barriers during digital change,

allowing confident employees to focus on substantive adaptation (Sharma et al. 2024). Digital systems may provide success experiences, feedback, monitoring, and vicarious learning that reinforce efficacy beliefs (Sgobbi 2026; Rosdiana et al. 2025). Readiness also contributes to business continuity in developing-country contexts where digital resources remain uneven (Nkomo and Kalisz 2026). Under Industry 5.0, this role extends beyond infrastructure to human-centered design, resilience, and sustainability (Arta et al. 2024). Digital readiness is therefore conceptualized as an enabling condition that may strengthen the translation of learning agility and change self-efficacy into adaptive performance. Accordingly, the fourth and fifth hypotheses are formulated as follows:

H4: Digital Readiness moderates the effect of Learning Agility on Adaptive Performance, such that the relationship is stronger at higher levels of Digital Readiness.

H5: Digital Readiness moderates the effect of Change Self-Efficacy on Adaptive Performance, such that the relationship is stronger at higher levels of Digital Readiness.

2.5 Organizational Resilience as a Moderating Variable

Organizational resilience is the capacity to anticipate, prepare for, respond to, and adapt to disruption while sustaining essential functions (Sgobbi 2026). In digital transformation, it can shape whether individual capabilities are converted into adaptive performance. Resilient organizations can mobilize and reallocate resources quickly, enabling employees to apply new learning in practice (Sulastri et al. 2023). They also provide sense-making, learning, and knowledge-integration mechanisms that help employees interpret change and transfer individual insight into shared organizational routines (Nkomo and Kalisz 2026; Klein et al. 2024). From a dynamic capabilities perspective, resilience reflects the ability to sense threats and opportunities, seize resources, and transform processes. Strategic agility has likewise been shown to condition the effects of digital transformation and ambidexterity on performance (Khan et al. 2025). Organizational resilience may therefore amplify the contribution of learning agility to adaptive performance.

Organizational resilience may also shape how change self-efficacy affects adaptive performance. Supportive culture, communication, leadership, and learning infrastructure can reduce stress and facilitate the implementation of change (Sgobbi 2026; Saleem et al. 2023). Higher digital-transformation maturity can strengthen the contribution of knowledge-management capability to operational resilience (Hoque et al. 2025), while agile decision making and digital literacy help organizations cope with disruption (Rotem 2022). Resilient systems may also reduce organizational barriers and sustain operational performance during technological change (Siddiqui et al. 2025; Sofic et al. 2022). Under Industry 5.0, resilience involves not only recovery but also proactive transformation and innovation. Accordingly, it is expected to strengthen the effects of both learning agility and change self-efficacy on adaptive performance. The sixth and seventh hypotheses are formulated as follows:

H6: Organizational Resilience moderates the effect of Learning Agility on Adaptive Performance, such that the relationship is stronger at higher levels of Organizational Resilience.

H7: Organizational Resilience moderates the effect of Change Self-Efficacy on Adaptive Performance, such that the relationship is stronger at higher levels of Organizational Resilience.

3 Methodology

This study used a quantitative explanatory design to examine structural relationships among the proposed variables. Data were collected through a cross-sectional survey, which captures perceptions at one point in time and is suitable for examining workforce readiness during ongoing digital transformation (Trenerry et al. 2021). Because the design is cross-sectional, the estimated paths are interpreted as structural associations rather than definitive causal effects. The model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. PLS-SEM is appropriate for complex predictive models involving multiple latent constructs and moderating relationships (Hair et al. 2022; Mahar et al. 2025). It also performs effectively with moderate sample sizes and is oriented toward maximizing explained variance in endogenous constructs, consistent with this study's objective of predicting adaptive performance and human capital readiness.

The population of this study comprised professional workers in South Kalimantan Province who use digital technology in their daily work and have experienced digital work-system change within their organizations. South Kalimantan was selected as the research locus because the region is currently undergoing accelerated digital transformation across the government, education, banking, and private industry sectors, thereby offering a relevant context for examining human resource readiness for digital change (Farlis et al. 2025).

A total of 350 respondents were recruited from 13 regencies and cities through purposive stratified sampling. Eligibility criteria were applied first, after which respondents were grouped by employment sector to capture variation in digital exposure and organizational context. The realized distribution is presented in Table 1.

Table 1
Sample Distribution by Respondent Group

No.	Respondent Group	n	Percentage (%)
1	Digital-based private employees/system administrators	167	47.7
2	Civil servants/military/police officers	115	32.9
3	Lecturers/educational staff	47	13.4
4	State-owned enterprise employees	14	4.0
5	Banking employees	7	2.0
Total		350	100.0

Three inclusion criteria were applied: respondents had at least one year of tenure in their current organization; actively used digital technology or information systems in daily work; and had experienced at least one digital work-system change, such as a new system implementation, platform migration, or digitally enabled process redesign (Saatçi et al. 2022; Hamid 2022). Data were collected over three months through a Google Forms survey distributed via institutional networks, professional groups, and organizational coordinators. The questionnaire contained demographic items and measures of Learning Agility, Change Self-Efficacy, Digital Readiness, Organizational Resilience, Adaptive Performance, and Human Capital Readiness. All construct items used a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), balancing measurement sensitivity and ease of response (Joshi et al. 2015).

Prior to the main data collection, the instrument was pilot tested on 30 respondents sharing similar characteristics with the target sample. All items recorded corrected item-total correlations above 0.30, and Cronbach's alpha exceeded 0.70 for every variable, indicating satisfactory internal consistency (Taber 2018). Based on respondent feedback at this stage, several items were revised to improve clarity of wording and suitability to the research context.

The complete 30-item measurement instrument and electronic consent form are provided in Online Resource 1. The source references used to adapt the construct measures are reported in the reference list.

Data were analyzed using PLS-SEM in SmartPLS 4. The measurement model was evaluated before hypothesis testing (Mahar et al. 2025; Hair et al. 2019). Convergent validity was assessed through outer loadings and Average Variance Extracted (AVE), with loadings of at least 0.70 and AVE of at least 0.50 used as primary criteria. Indicators between 0.40 and 0.70 were retained only when removal did not materially improve AVE or composite reliability. Discriminant validity was examined using the Heterotrait-Monotrait ratio (HTMT < 0.90) and the Fornell-Larcker criterion. Reliability was assessed using Cronbach's alpha and composite reliability, with values of at least 0.70 considered acceptable.

After the measurement model met the required criteria, the structural model was evaluated using path coefficients, t-statistics, p-values, and bias-corrected and accelerated 95% confidence intervals obtained through bootstrapping (Hair et al. 2022). A two-tailed significance level of 0.05 was applied; a hypothesis was supported when the path was significant and its direction matched the theoretical prediction. The coefficient of determination (R^2) assessed explained variance, while Q^2 values above zero indicated predictive relevance (Stone 1974). Moderating effects were estimated with the two-stage approach in SmartPLS. Positive interaction coefficients indicate strengthening effects, whereas negative coefficients indicate weakening effects. Simple-slope analysis was used to interpret significant interactions.

Use of generative AI-assisted tools. Generative AI-assisted tools were used during manuscript preparation for language editing, formatting, and structural refinement. All scientific claims, analyses, interpretations, and final text were reviewed and approved by the authors, who retain full responsibility for the content.

4 Results

This section presents the demographic and professional characteristics of the 350 respondents. The characteristics examined include gender, age, educational level, employment sector, length of employment, frequency of digital technology use, and experience in organizational digital transformation.

Table 2
Respondent Characteristics

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	152	43.4
	Female	198	56.6
Gender Total		350	100.0
Age	20–29 years	188	53.7
	30–39 years	66	18.9
	40–49 years	75	21.4
	50 years and above	21	6.0
Age Total		350	100.0
Educational Level	Diploma	14	4.0
	Bachelor's degree	256	73.1
	Master's degree	71	20.3
	Doctoral degree	9	2.6
Educational Level Total		350	100.0
Employment Sector	Digital-based private employee/system administrator	167	47.7
	Civil servant/military/police officer	115	32.9
	Lecturer/educational staff	47	13.4
	State-owned enterprise employee	14	4.0
	Banking employee	7	2.0
Employment Sector Total		350	100.0
Length of Employment	1–3 years	162	46.3
	4–6 years	46	13.1
	7–10 years	30	8.6
	More than 10 years	112	32.0
Length of Employment Total		350	100.0
Frequency of Digital Technology Use	Rarely	16	4.6
	Occasionally	57	16.3

Characteristic	Category	Frequency (n)	Percentage (%)
	Frequently	168	48.0
	Very frequently	109	31.1
Digital Technology Use Total		350	100.0
Digital Transformation Experience	Once	111	31.7
	Two to three times	116	33.1
	More than three times	123	35.1
Digital Transformation Experience Total		350	100.0

Table 3
Evaluation of the Measurement Model

Abbr		Outer Loading	Ca	C.R	AVE	VIF
Learning Agility (LA)			0.853	0.894	0.629	
LA1	I am able to learn quickly from work experience and apply it in new situations	0.779				1.793
LA2	I actively seek feedback to improve performance and develop my competencies	0.740				1.660
LA3	I can adjust my work approach when facing unfamiliar challenges or situations	0.825				2.124
LA4	I am able to reflect on past experiences to improve future performance	0.810				1.872
LA5	I have the cognitive flexibility to adapt to technological changes and new work systems	0.809				1.985
Change Self-Efficacy (CSE)			0.913	0.935	0.742	
CSE1	I am confident that I can successfully face digital work system changes in my organization	0.839				2.496
CSE2	I am confident in my ability to effectively adopt new technologies and systems	0.889				3.208
CSE3	I am able to overcome obstacles and challenges that arise during the digital change process	0.863				2.713
CSE4	Past experience makes me confident that I can perform well after digital changes are implemented	0.863				2.683
CSE5	I have the necessary skills to adapt to digital transformation in the workplace	0.852				2.445
Digital Readiness (DR)			0.907	0.931	0.730	
DR1	My organization provides adequate digital technology infrastructure to support my work	0.866				2.458
DR2	My organization has a culture that encourages the adoption and utilization of digital technology	0.849				2.378
Source: Processed primary data (2026)						

Abbr		Outer Loading	Ca	C.R	AVE	VIF
DR3	I receive sufficient training and support to use digital systems and applications	0.825				2.206
DR4	I have easy access to the technology and digital devices needed to work	0.872				2.717
DR5	My organization proactively integrates digital technology into business and operational processes	0.859				2.537
Organizational Resilience (OR)			0.916	0.937	0.749	
OR1	My organization is able to recover quickly from disruptions or crises caused by technological changes	0.820				2.194
OR2	My organization has system flexibility that allows adaptation to changes	0.895				3.262
OR3	Organizational management provides strong support to employees in facing digital change	0.870				2.879
OR4	My organization has the capacity to learn from experience and continuously improve processes	0.840				2.414
OR5	My organization can maintain operational performance despite facing technological disruption	0.900				3.285
Adaptive Performance (AP)			0.928	0.946	0.778	
AP1	I am able to adjust my way of working quickly when there are changes in tasks or procedures	0.873				2.814
AP2	I can handle uncertain or ambiguous work situations effectively	0.882				3.109
AP3	I am able to learn new tasks, technologies, or procedures quickly and apply them at work	0.884				3.107
AP4	I can work productively under constantly changing or stressful conditions	0.878				3.165
AP5	I am able to identify and respond flexibly to changes in work priorities	0.891				3.409
Human Capital Readiness (HCR)			0.927	0.945	0.775	
Source: Processed primary data (2026)						

Abbr		Outer Loading	Ca	C.R	AVE	VIF
HCR1	I have digital competencies that are relevant to job demands in the digital transformation era	0.857				2.551
HCR2	I am ready to face career changes that may occur due to the development of digital technology	0.878				2.895
HCR3	I am committed to continuously learning and developing new skills throughout my career	0.897				3.287
HCR4	My expertise and knowledge are still relevant and applicable in the context of Industry 4.0	0.875				2.930
HCR5	I have the mental readiness and ability to adapt to fundamental changes in the world of work	0.894				3.265
Source: Processed primary data (2026)						

Table 3 indicates that the outer measurement model satisfies the required reliability and validity criteria. All indicator loadings range from 0.740 to 0.900, exceeding the recommended threshold of 0.70. Cronbach’s alpha values range from 0.853 to 0.928, while composite reliability values range from 0.894 to 0.946, confirming satisfactory internal consistency. The AVE values range from 0.629 to 0.778, demonstrating adequate convergent validity. In addition, all VIF values are below 5.00, indicating that multicollinearity is not a concern. Therefore, all indicators and constructs are considered reliable and valid for further structural model analysis.

4.1 Assessment of the Structural Model

Table 4

Coefficient of Determination (R²)

Endogenous Latent Factors	R Square	R Square Adjusted
Adaptive Performance	0.746	0.740
Human Capital Readiness	0.734	0.731
Source: Processed primary data (2026)		

Table 4 shows that the model has substantial explanatory power. The R² value of 0.746 indicates that 74.6% of the variance in Adaptive Performance is explained by its predictors in the structural model, while the remaining 25.4% is attributable to factors outside the model. Similarly, the R² value of 0.734 indicates that the model explains 73.4% of the variance in Human Capital Readiness. The adjusted R² values of 0.740 and 0.731 remain close to the corresponding R² values, indicating that the model’s

explanatory capacity is stable after accounting for the number of predictors. Overall, both endogenous constructs demonstrate strong explanatory power.

Bootstrapping supported H1, H2, and H3: Learning Agility and Change Self-Efficacy significantly predicted Adaptive Performance, and Adaptive Performance significantly predicted Human Capital Readiness. Digital Readiness did not significantly moderate either proposed relationship. Organizational Resilience significantly strengthened the Learning Agility-Adaptive Performance relationship (H6), whereas its interaction with Change Self-Efficacy was significant but negative; therefore, H7 was not supported because the observed direction contradicted the hypothesized strengthening effect.

Table 5
Path Coefficients and Hypothesis Testing Results

Hypothesis	Relationship	β	T-statistic	P-value	Decision
H1	Learning Agility → Adaptive Performance	0.186	2.867	0.004	Supported
H2	Change Self-Efficacy → Adaptive Performance	0.301	3.820	< 0.001	Supported
H3	Adaptive Performance → Human Capital Readiness	0.498	6.736	< 0.001	Supported
H4	Moderating role of Digital Readiness in the relationship between Learning Agility and Adaptive Performance	-0.024	0.354	0.723	Not supported
H5	Moderating role of Digital Readiness in the relationship between Change Self-Efficacy and Adaptive Performance	0.089	0.974	0.330	Not supported
H6	Moderating role of Organizational Resilience in the relationship between Learning Agility and Adaptive Performance	0.135	2.595	0.010	Supported
H7	Moderating role of Organizational Resilience in the relationship between Change Self-Efficacy and Adaptive Performance	-0.196	2.424	0.016	Not supported

Source: Primary data processed by the authors (2026).

The results indicate that H1, H2, H3, and H6 are supported. Learning Agility and Change Self-Efficacy significantly improve Adaptive Performance, while Adaptive Performance significantly enhances Human Capital Readiness. Digital Readiness does not significantly moderate the proposed relationships. Organizational Resilience strengthens the relationship between Learning Agility and Adaptive Performance, whereas its moderating effect on the relationship between Change Self-Efficacy and Adaptive Performance is significant but negative, contrary to the hypothesized direction.

5 Discussion

The results converge on a single organizing conclusion: human capital readiness in digitalizing organizations is generated by the behavioral conversion of individual capability into adaptive action, and organizational context governs that conversion unevenly rather than uniformly. Learning agility and change self-efficacy both operate as proximal psychological antecedents of adaptive performance, which in turn shows the strongest single association with human capital readiness. The contextual constructs, however, behave in ways the hypotheses did not anticipate. Digital readiness produced no detectable boundary effect on either capability–performance relationship, whereas organizational resilience amplified the contribution of learning agility while attenuating that of change self-efficacy. The model accounts for a substantial share of variance in both endogenous constructs, indicating that the operative mechanism of readiness is behavioral rather than infrastructural.

The support for H1 and H2 confirms that adaptive performance rests on psychological capability rather than technical qualification alone. More informative is the difference in magnitude: change self-efficacy carried a coefficient roughly sixty percent larger than learning agility, plausibly because the two constructs sit at different distances from the behavior being predicted. Change self-efficacy is a situation-specific judgment about one's capacity to manage a particular class of disruption; in Theory of Planned Behavior terms it approximates perceived behavioral control, the determinant most proximal to intention and enactment (Ajzen 2020; Hagger and Hamilton 2025). Employees who believe they can handle a system migration or a redesigned workflow appraise it as a challenge rather than a threat and mobilize effort accordingly a mechanism evidenced by Albrecht et al. (2023) for change engagement, by Schoch (2023) for challenge appraisal under altered work arrangements, by Khusna and Pratiwi (2022), where readiness to change transmitted efficacy beliefs into performance, and by Darayseh (2023) in technology-specific settings.

Learning agility, by contrast, functions as a meta-competency whose returns accrue over longer cycles and often through intermediate processes. Nandini and Gustomo (2022) show active learning mediating the path from engagement to adaptive performance, and Nurmiyati et al. (2026) show learning agility itself shaped by training and organizational flexibility its influence is partly channelled through conditions external to the individual. The sample reinforces this: most respondents were under thirty and nearly half reported one to three years of tenure, so the experiential repertoire from which agility draws is comparatively shallow, whereas efficacy beliefs form rapidly through exposure and four in five used digital technology frequently or very frequently. The smaller association of learning agility therefore indicates a slower, cumulative pathway (Erceg et al. 2020; Saefullah et al. 2024) rather than a substantively weaker one.

H3 is the strongest relationship in the model and the most consequential conceptually. Human capital readiness is constituted not by the possession of digital knowledge or credentialed competence, but by the capacity to convert those resources into adaptive behavior under changing task conditions. Khaerunnisa et al. (2026), working from Human Capital Theory and the resource-based view, argue

precisely this: digital competence is a valuable stock requiring dynamic capabilities for effective deployment. Krisnaresanti et al. (2026) reach a parallel conclusion: readiness does not follow spontaneously from efficacy beliefs but is formed through dynamic capability. Descriptively, almost all respondents held at least a bachelor's degree, yet readiness still traced through adaptive behavior rather than educational stock. Adaptive performance is thus the proximal mechanism linking capability to readiness, consistent with the emphasis on adaptability-related skills in Sony and Mekoth (2022) and Farlis et al. (2025), and with employability research in which continuous adjustment rather than terminal qualification sustains workforce value (Murawski and Bick 2017; Wymann et al. 2021).

The non-significant moderating effects in H4 and H5 require interpretation rather than dismissal. Digital readiness may have functioned as a baseline resource rather than a differentiating condition because most respondents already worked with digital systems. It may also operate more directly as an enabling capability than as a moderator, consistent with studies linking digital capability to innovation, performance, and workforce empowerment (Khin and Ho 2019; Ghobakhloo et al. 2026; Dyah et al. 2025). In addition, digital infrastructure does not automatically create employee-level empowerment; its value depends on interpretation, collaborative use, and organizational support (Cetindamar Kozanoglu and Abedin 2021; Nkomo and Kalisz 2026). Sectoral differences across public service, higher education, banking, state-owned enterprises, and digital-based private organizations may also have offset one another in the pooled interaction estimates.

H6, by contrast, indicates that organizational resilience supplies the context in which learning agility becomes behaviorally productive. Resilient organizations reallocate resources quickly, tolerate experimentation and its failures, sustain managerial support through disruption, and integrate dispersed individual learning into shared repertoires (He 2021; Kantabutra 2021; Klein et al. 2024; Sulastri et al. 2023). Under such conditions, what an agile learner discovers can actually be implemented; where flexibility and knowledge-sharing infrastructure are absent, the same learning remains private and unconverted a complementarity consistent with Sgobbi (2026) and Nurmiyati et al. (2026).

H7 was statistically significant but negative, so the hypothesized strengthening effect was not supported. One plausible explanation is substitution: highly resilient organizations may formalize routines, centralize crisis response, and provide collective support that reduces the marginal contribution of personal confidence. Kantabutra's (2021) distinction between adaptive and buffering capacity supports this interpretation, while He (2021) similarly links systematic control with individual contribution. Dense procedures may also limit discretion, giving confident employees fewer opportunities to translate self-efficacy into adaptive action. This result does not imply that resilience is harmful; rather, it suggests that individual and organizational resources may partly substitute for one another (Deviana and Hendarsjah 2023).

The theoretical contribution follows from these asymmetries. Individual psychological capabilities shape adaptive performance directly; adaptive performance is the proximal mechanism through which those capabilities become human capital readiness; digital readiness is not automatically an amplifying

condition and is better specified as an enabling resource; and organizational resilience exerts asymmetric moderation, complementing learning agility while substituting for change self-efficacy. This last result is the least intuitive and most generative, suggesting that organizational context selectively amplifies capabilities the organization cannot supply and displaces those it can.

Practically, infrastructure provision is not a readiness strategy. Investment in platforms and connectivity should be paired with deliberate development of learning agility, change-related confidence, and adaptive work practices experiential and rotational assignments, structured reflection on transformation episodes, managerial support during system change, and learning mechanisms that make individual discoveries collectively usable. The asymmetric moderation adds a caution: resilience-building should preserve space for individual discretion rather than proceduralize it away, particularly where response systems are already formalized.

Read as a whole, and with the limits of a cross-sectional design acknowledged, these findings indicate that workforce readiness in the digital era depends far less on the availability of technology than on the interaction between employees' individual adaptive capacities and the organization's ability to create conditions in which those capacities can be translated into effective performance. Digital systems establish the possibility of transformation; adaptive behavior, supported by contexts that enable rather than substitute for individual initiative, determines whether that possibility is realized.

6 Conclusion

This study demonstrates that human capital readiness in the digital era is shaped primarily through adaptive performance rather than through technological readiness alone. Learning agility and change self-efficacy both significantly enhance adaptive performance, while adaptive performance, in turn, strongly contributes to human capital readiness. These findings confirm that workforce readiness depends not only on employees' knowledge or technical competence, but also on their ability to translate psychological capabilities into effective behavior under changing work conditions.

The moderating results reveal an important asymmetry. Digital readiness does not significantly strengthen the effects of learning agility or change self-efficacy on adaptive performance, indicating that infrastructure and technology access may function as baseline enabling conditions rather than as amplifying mechanisms. Organizational resilience, however, strengthens the contribution of learning agility to adaptive performance, but weakens the contribution of change self-efficacy. This suggests that resilient organizational systems may complement employees' capacity to learn while partially substituting for individual confidence in managing change.

The study contributes by identifying adaptive performance as the central mechanism connecting individual capabilities with human capital readiness and by showing that organizational context affects those capabilities differently. Practically, organizations should combine digital investment with learning-oriented work design, confidence-building interventions, managerial support, flexible systems, and knowledge-sharing mechanisms. Because the design is cross-sectional, the findings represent structural

associations rather than causal effects. Future research should use longitudinal or multi-group designs across sectors and levels of digital maturity.

Declarations

Ethics approval

This study employed a non-interventional, cross-sectional survey involving adult professional workers. Participation was voluntary, and no sensitive personal, clinical, or biological data were collected. Respondents were informed about the purpose of the study, the voluntary nature of participation, the confidentiality of their responses, and their right to decline participation. Formal review or approval by an ethics committee was not obtained before data collection; therefore, no ethical approval or exemption number is available.

Consent to participate

Electronic informed consent to participate was obtained from all participants before data collection. Only respondents who affirmatively indicated their agreement were permitted to proceed to the questionnaire.

Consent for publication

Not applicable. The manuscript contains no information, images, or other material that identifies an individual participant.

Competing interests

The authors have no relevant financial or non-financial interests to disclose.

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Data availability

The de-identified data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available because the informed consent obtained from participants did not include consent for public data archiving.

Author contributions

Prasetyo Yuli Usaid: Conceptualization. Ramoti Stevan Carlos Pakpahan: Methodology; Project administration. Muhammad Rais Arifin: Investigation. Siti Nadiya Hajati: Resources; Data curation. Andi Fitrianto: Methodology; Validation. Fredy Jayen: Software; Formal analysis. Wenny Djuarni: Writing - original draft. Sri Rahayu: Visualization. Syahrial Shaddiq: Validation; Writing - original draft; Supervision.

Rahmatullah Alfikri: Writing - review and editing. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for their respective contributions.

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Figures

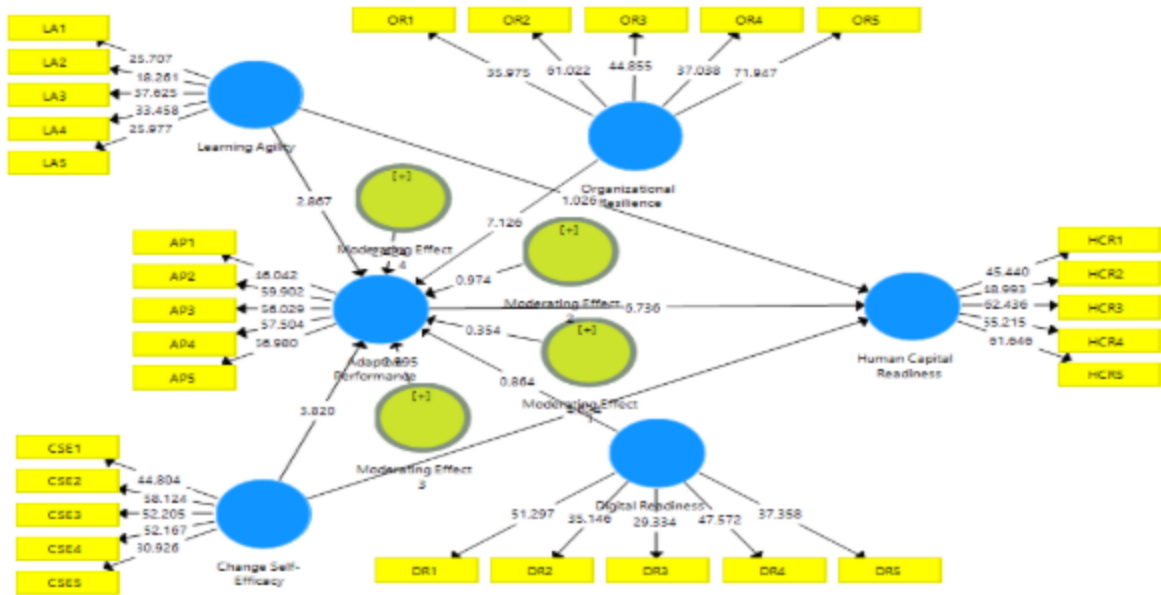


Figure 1

Research model and relationships among variables

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