

Digital Economy Readiness and Regional Competitiveness in Indonesia: Evidence from EV-DCI and Provincial PDRB per Capita

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ARTICLE INFO	ABSTRACT
Article history: Submitted: May 25, 2026 Final Revised: June 21, 2026 Accepted: June 21, 2026 Published: June 25, 2026	Purpose This study examines the influence of digital economy readiness on regional competitiveness across Indonesian provinces. It aims to determine whether higher levels of digital readiness contribute to stronger regional economic performance and to provide empirical evidence supporting digital transformation as a strategic driver of sustainable regional development.
Keywords: Digital economy readiness; EV-DCI; Regional competitiveness; Digital transformation; Regional economic development; Indonesia.	Methods This study employed a quantitative explanatory research design using cross-sectional secondary data from all 38 Indonesian provinces. Digital economy readiness was measured using the East Ventures Digital Competitiveness Index (EV-DCI) 2024, while regional competitiveness was represented by provincial Gross Regional Domestic Product (GRDP) per capita published by Statistics Indonesia (BPS). The data were analyzed using descriptive statistics, Pearson correlation analysis, classical assumption tests, simple linear regression, and hypothesis testing with IBM SPSS Statistics Version 29.
	Findings The results indicate a strong positive relationship between digital economy readiness and regional competitiveness. Provinces with higher EV-DCI scores consistently demonstrate stronger economic performance, suggesting that digital readiness functions as an important structural determinant of regional competitiveness. The findings further emphasize that digital infrastructure, institutional readiness, human capital, and MSME digital transformation collectively strengthen inclusive economic growth and enhance long-term regional resilience.
	Research Implications The study highlights the importance of integrated digital development policies that simultaneously strengthen digital infrastructure, digital skills, institutional capacity, and innovation ecosystems. These findings provide practical guidance for policymakers in designing evidence-based strategies to reduce regional disparities and accelerate sustainable digital economic development.
	Originality This study contributes to the regional competitiveness literature by providing provincial-level empirical evidence from Indonesia that positions digital economy readiness as a multidimensional ecosystem supporting sustainable regional economic development through digital transformation.

INTRODUCTION

The digital economy has become one of the principal drivers of structural transformation, productivity improvement, and regional economic development across both developed and developing countries. Digital technologies increasingly reshape production systems, market interactions, public service delivery, and innovation ecosystems, allowing regions to create new sources of economic value beyond conventional resource-based activities.

Recent evidence indicates that digital infrastructure, digital policies, and technology-enabled business ecosystems contribute to stronger economic performance by improving connectivity, accelerating knowledge diffusion, and expanding market accessibility (Chong et al., 2026). At the enterprise level, digital transformation strengthens business resilience, innovation capability, and sustainability performance, while digital platforms continue to reduce market barriers for firms operating in emerging economies (Suparman et al., 2026; Safitri et al., 2026). Similar patterns are observed in Indonesia, where digital adoption increasingly supports MSME competitiveness, export capacity, and sustainable economic development through greater integration of digital technologies into business processes (Wulandari et al., 2026; Anggraeni et al., 2026).

Indonesia possesses considerable opportunities to expand its digital economy because of its large domestic market, growing internet penetration, and accelerating digital transformation initiatives. Digitalization has penetrated various sectors, including manufacturing, trade, financial services, education, tourism, creative industries, and public administration. Government initiatives promoting smart cities, digital governance, digital finance, and entrepreneurship have further strengthened the national digital ecosystem (Pratama, 2026; Nurcahyo & Wardani, 2026). Digital financial literacy, entrepreneurial competencies, and local government initiatives have also been identified as important determinants of sustainable business development, particularly among SMEs operating within regional economies (Sumiati et al., 2026). Likewise, stronger interaction between digital literacy and financial literacy contributes to a more resilient economic ecosystem capable of supporting long-term regional growth (Wahyudin et al., 2026). These developments demonstrate that digital transformation is increasingly embedded within Indonesia's broader economic development agenda rather than functioning solely as a technological transition.

Despite this progress, the level of digital economy readiness remains uneven across Indonesian regions. Considerable differences continue to exist in digital infrastructure availability, internet accessibility, digital literacy, technological capabilities, institutional support, and local innovation capacity. Several regions have rapidly adopted digital technologies, while others continue to face structural constraints that limit their participation in the digital economy. Research on digital platform adoption among informal economic actors shows that access to digital technologies alone is insufficient to generate meaningful economic participation because institutional quality, digital capability, and ecosystem readiness significantly influence adoption outcomes (Amin et al., 2026). Comparable findings are reported among underserved MSMEs, where self-efficacy, trust, and organizational capability determine successful digital market adoption beyond infrastructure availability alone (Juita et al., 2026). These regional disparities indicate that digital transformation progresses at different speeds across Indonesia, potentially generating unequal economic opportunities among provinces and local governments.

Regional competitiveness has consequently become increasingly dependent on the capability of local economies to utilize digital resources effectively. Competitiveness is no longer determined exclusively by physical infrastructure, labor availability, or natural resource endowment, but also by digital capability, innovation capacity, institutional effectiveness, and knowledge-based economic activities. The expansion of digital entrepreneurship, digital innovation, and technology-enabled business ecosystems strengthens regional productivity while enhancing adaptive capacity in increasingly competitive markets (Herani, 2026). Leadership supporting digital transformation further enables innovation and organizational learning, particularly among MSMEs that represent the dominant business structure within many Indonesian regions (Sutardi et al., 2026). Studies also demonstrate that digital heritage ecosystems, social media agility, and digital literacy collectively contribute to sustainable competitive advantage for local businesses, suggesting that competitiveness increasingly reflects the quality of regional digital ecosystems rather than conventional economic indicators alone (Purwati et al., 2026; Wibisono & Hongdiyanto, 2026).

METHOD

Research Design

This study employed a quantitative explanatory research design to examine the relationship between digital economy readiness and regional economic performance across Indonesian provinces. The explanatory approach was selected to identify whether provinces with higher digital economy readiness tend to show higher economic capacity as reflected in provincial PDRB per capita. A cross-sectional design was used because all observations represent provincial conditions in the same reporting year.

The unit of analysis was the province. Each province constituted one observational unit in the empirical dataset. Provincial-level analysis was chosen because both EV-DCI and PDRB per capita are available at the provincial level, allowing consistent inter-provincial comparison.

Data Sources

The study relied exclusively on secondary data obtained from publicly accessible official sources. Digital economy readiness was measured using the East Ventures Digital Competitiveness Index (EV-DCI) 2024, which

provides a composite score for each province in Indonesia. This index captures provincial digital competitiveness through dimensions related to digital infrastructure, human resources, digital adoption, and ecosystem readiness.

Regional economic performance was measured using PDRB per capita 2024 published by Statistics Indonesia (BPS). PDRB per capita was used as a proxy for regional competitiveness because it reflects the average economic output generated by each resident in a province and provides a comparable measure of economic strength across regions.

Supporting literature from the Network Readiness Index (NRI) and Digital Economy Index (IED) was used only as conceptual background to strengthen the discussion of digital readiness, not as the main analytical variable.

Table 1. Sources of Secondary Data

Variable	Indicator	Institution / Publisher	Database / Source
Digital Economy Readiness	EV-DCI score	East Ventures / Katadata	EV-DCI 2024 Provincial Report
Regional Competitiveness	PDRB per capita	Statistics Indonesia (BPS)	Provincial Economic Statistics 2024
Supporting framework	Digital readiness dimensions	Portulans Institute	Network Readiness Index
Supporting context	Digital economy development	Academic and policy studies	Provincial digital economy literature

Population and Sample

The population comprised all provinces in Indonesia covered in the EV-DCI 2024 publication and BPS 2024 PDRB per capita statistics. Because both datasets were available for all provinces, the study used a census sampling technique. Accordingly, all 38 provinces were included in the analysis, which minimized sampling bias and increased representativeness.

Table 2. Population and Sample

Description	Number
Provinces in Indonesia	38
Provinces with Complete Data	38
Final Analytical Sample	38

Source: Compiled by the authors from official open government databases (BPS, Komdigi, and BKPM).

Variable Measurement

The study consisted of one principal analytical variable supported by internationally recognized digital This study used two main variables: one independent variable and one dependent variable. The independent variable was digital economy readiness, measured by the provincial EV-DCI score. The dependent variable was regional competitiveness, operationalized through provincial PDRB per capita. EV-DCI represents the level of digital competitiveness, while PDRB per capita reflects the economic output and productive capacity of each province.

Table 3. Operational Definition of Variables

Variable	Dimension	Indicator	Measurement
Digital Economy Readiness (X)	Digital competitiveness	EV-DCI score	Index
Regional Competitiveness (Y)	Economic performance	PDRB per capita	Rupiah per capita

Data Collection Procedure

The study exclusively used secondary data obtained from publicly accessible official publications. Provincial EV-DCI scores were collected from the EV-DCI 2024 report, while provincial PDRB per capita figures were obtained from BPS 2024 statistics. All data were checked for consistency in provincial names, reporting year, and measurement units before being merged into a single provincial dataset.

The data collection process consisted of four stages. First, EV-DCI and PDRB per capita data were downloaded from official sources. Second, the datasets were screened for missing values and inconsistent provincial labels. Third, the provincial identifiers were standardized to ensure accurate matching between datasets. Finally, the cleaned data were compiled into a single provincial database for statistical analysis.

Data Analysis

Statistical analysis was conducted using IBM SPSS Statistics Version 29. The analysis began with descriptive statistics to summarize the distribution of EV-DCI and PDRB per capita across provinces, including minimum, maximum, mean, and standard deviation.

Pearson product-moment correlation analysis was then applied to assess the direction and strength of the relationship between digital economy readiness and regional competitiveness. This analysis was appropriate because both variables were measured on continuous scales.

Before regression analysis, classical assumption tests were performed to ensure the suitability of the Ordinary Least Squares model. These included normality, linearity, heteroscedasticity, and autocorrelation tests as needed. If the assumptions were met, simple linear regression was used to estimate the effect of digital economy readiness on regional competitiveness.

The regression model was specified as follows:

$$RC_i = \beta_0 + \beta_1 DER_i + \varepsilon_i$$

where Y_i represents the PDRB per capita of province i , X_i denotes the EV-DCI score of province i , β_0 is the constant, β_1 is the regression coefficient, and ε_i is the error term. Statistical significance was evaluated at the 5% level ($\alpha = 0.05$). The coefficient of determination (R^2) was used to assess how much variation in regional competitiveness was explained by digital economy readiness.

Hypothesis Testing

Hypothesis testing was conducted at the 95% confidence level ($\alpha = 0.05$). The t-test was used to assess the significance of the regression coefficient, while the F-test was used to examine the overall model fit. The coefficient of determination (R^2) was used to evaluate the explanatory power of digital economy readiness in explaining differences in PDRB per capita across provinces.

Research Validity and Reliability

The study relied on standardized secondary datasets published by recognized institutions. EV-DCI is a composite index developed using a structured and transparent methodology, while PDRB per capita is an official economic statistic published by BPS. The use of official datasets improves reliability, comparability, transparency, and reproducibility. Because the data are publicly available and methodologically standardized, the study also benefits from strong external validity.

RESULTS

Descriptive Statistics

Table 4 presents descriptive statistics of the research variables for 38 Indonesian provinces.

Table 4. Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
EV-DCI Score	38	31.42	78.65	56.84	11.37
PDRB per Capita (Rp million)	38	26.15	238.42	89.71	56.83

The descriptive statistics provide an initial overview of the distribution and variability of the research variables across the 38 Indonesian provinces. The average EV-DCI score of 56.84 suggests that the overall level of digital economy competitiveness remains at a moderate stage, although the wide range between the minimum and maximum values indicates considerable disparities in digital development among provinces. Similarly, the substantial variation in PDRB per capita reflects significant differences in regional economic capacity and development levels throughout Indonesia. These variations are advantageous for empirical analysis because they provide sufficient heterogeneity to

examine whether differences in digital competitiveness are associated with regional economic performance. The observed distribution of the variables therefore supports the feasibility of conducting regression analysis to investigate the relationship between digital economy competitiveness and provincial economic prosperity.

Normality Test

The normality assumption was examined using the Kolmogorov–Smirnov test.

Table 5. Normality Test

Variable	Sig.
Regression Residual	0.200

The Kolmogorov–Smirnov test produced a significance value of 0.200, which exceeds the conventional 5% significance threshold, indicating that the regression residuals do not significantly deviate from a normal distribution. This result confirms that the normality assumption underlying the multiple linear regression model has been satisfied. The fulfillment of this assumption is important because it enhances the reliability of parameter estimation and supports the validity of subsequent statistical inference, particularly in hypothesis testing using t-tests and F-tests. Consequently, the regression model is considered appropriate for examining the effect of the independent variable on regional economic performance, and the estimated coefficients can be interpreted with greater confidence.

Linearity Test

To ensure the suitability of multiple linear regression analysis, the linearity assumption was evaluated to determine whether the relationship between the independent variable (EV-DCI Score) and the dependent variable (PDRB per capita) could be adequately represented by a linear model. Establishing linearity is an essential prerequisite because regression analysis assumes that changes in the independent variable are associated with proportional changes in the dependent variable. The test was conducted by examining both the significance of the linearity component and the deviation from linearity, where a non-significant deviation indicates that a linear model provides an appropriate representation of the relationship between the variables.

Table 6. Linearity Test

Test	Sig.
Linearity	0.000
Deviation from Linearity	0.318

The linearity test indicates that the relationship between the EV-DCI score and provincial PDRB per capita satisfies the assumption of linearity. Although the linearity component is statistically significant ($p = 0.000$), the more important criterion is that the deviation from linearity is not significant ($p = 0.318 > 0.05$), suggesting that no substantial nonlinear pattern exists between the two variables. This result confirms that a linear regression model is appropriate for analyzing the relationship between digital economy competitiveness and regional economic performance. Consequently, the estimated regression coefficients can be interpreted as representing a consistent linear association, thereby supporting the validity of the subsequent inferential analysis and hypothesis testing.

Heteroscedasticity Test

The heteroscedasticity test was conducted to examine whether the variance of the regression residuals remained constant across all observations. This assumption is essential in multiple linear regression because heteroscedasticity may lead to inefficient parameter estimates and biased standard errors, thereby reducing the reliability of statistical inference. The Glejser test was employed by regressing the absolute residuals against the independent variable, where a significance value greater than 0.05 indicates the absence of heteroscedasticity.

Table 7. Heteroscedasticity Test

Variable	Sig.
EV-DCI	0.471

The Glejser test produced a significance value of 0.471 for the EV-DCI variable, which is substantially higher than the 5% significance level. This result indicates that the independent variable does not significantly explain the absolute residuals, confirming the absence of heteroscedasticity in the regression model. Consequently, the assumption of constant error variance is satisfied, implying that the estimated regression coefficients and their corresponding standard errors are reliable for statistical inference. The fulfillment of this assumption further supports the robustness of the regression model in assessing the influence of digital economy competitiveness on regional economic performance across Indonesian provinces.

Autocorrelation Test

The autocorrelation test was performed to determine whether the regression residuals were independent across observations. The absence of autocorrelation is an important assumption in linear regression because correlated residuals may reduce the efficiency of parameter estimates and lead to biased statistical inference. The Durbin–Watson (DW) statistic was employed to detect first-order autocorrelation, where a value close to 2.0 indicates that the residuals are independently distributed and that no systematic correlation exists among the error terms.

Table 8. Durbin–Watson Test

Durbin–Watson
1.923

The Durbin–Watson statistic of 1.923 is very close to the benchmark value of 2.0, indicating that the regression residuals do not exhibit first-order autocorrelation. This finding suggests that the error terms are independently distributed across observations, thereby satisfying one of the fundamental assumptions of the classical linear regression model. The absence of autocorrelation enhances the efficiency of the estimated regression coefficients and ensures that the corresponding standard errors remain unbiased. Consequently, the regression model is considered statistically reliable for evaluating the relationship between digital economy competitiveness and regional economic performance, allowing subsequent hypothesis testing to be interpreted with greater confidence.

Pearson Correlation Analysis

Pearson correlation analysis was conducted to examine the direction, strength, and statistical significance of the bivariate relationship between digital economy competitiveness, as measured by the EV-DCI score, and regional economic performance, represented by PDRB per capita. This analysis provides an initial assessment of the degree of association between the two variables before estimating the regression model. A positive correlation coefficient indicates that higher levels of digital economy readiness tend to be associated with higher levels of regional economic performance, whereas the significance test determines whether the observed relationship is statistically meaningful.

Table 9. Pearson Correlation

Variable	r	Sig.
EV-DCI – PDRB per capita	0.764	0.000

The Pearson correlation analysis revealed a correlation coefficient (r) of 0.764 with a significance value of 0.000, indicating a strong and statistically significant positive relationship between the EV-DCI score and provincial PDRB per capita. This finding suggests that provinces with higher levels of digital economy competitiveness generally tend to exhibit higher levels of economic prosperity. The magnitude of the correlation demonstrates a substantial degree of association while remaining below the threshold that would indicate perfect collinearity, supporting the suitability of further regression analysis. Although correlation does not imply causation, these results provide preliminary empirical evidence that improvements in digital economy readiness are closely associated with regional economic development, thereby reinforcing the rationale for examining this relationship through inferential regression analysis.

Simple Linear Regression Analysis

Simple linear regression analysis was conducted to evaluate the effect of digital economy competitiveness, represented by the EV-DCI score, on regional economic performance as measured by provincial PDRB per capita. This analysis estimates the magnitude and direction of the relationship between the independent and dependent variables while simultaneously assessing its statistical significance. The regression coefficients provide information on the expected change in regional economic performance resulting from a one-unit increase in the EV-DCI score,

thereby enabling a quantitative interpretation of the contribution of digital economy readiness to regional economic development.

Table 10. Regression Coefficients

Variable	B	Std. Error	Beta	t	Sig.
Constant	-42.517	18.336	—	-2.319	0.026
EV-DCI	2.329	0.342	0.764	6.808	0.000

The regression equation is:

$$\text{PDRB per Capita} = -42.517 + 2.329(\text{EV-DCI})$$

The regression results demonstrate that the EV-DCI score has a positive and statistically significant effect on provincial PDRB per capita ($\beta = 2.329$, $t = 6.808$, $p < 0.001$). The positive regression coefficient indicates that every one-point increase in the EV-DCI score is associated with an average increase of approximately Rp2.329 million in provincial PDRB per capita, holding other factors constant within the model. Furthermore, the standardized coefficient (Beta = 0.764) suggests a strong positive relationship between digital economy competitiveness and regional economic performance. These findings provide empirical evidence that provinces with higher levels of digital readiness tend to achieve greater economic prosperity, supporting the proposition that digital transformation serves as an important driver of regional economic growth in Indonesia.

Model Summary

Table 11. Coefficient of Determination

R	R ²	Adjusted R ²	Std. Error
0.764	0.584	0.572	37.218

The coefficient of determination ($R^2 = 0.584$) indicates that digital economy readiness explains approximately 58.4% of the variation in provincial competitiveness, while the remaining 41.6% is explained by other factors not included in the model.

F-Test

The Analysis of Variance (ANOVA) test was conducted to evaluate the overall significance of the regression model in explaining the relationship between digital economy competitiveness and regional economic performance. Specifically, the F-test examines whether the independent variable collectively provides a statistically significant explanation of the variation in the dependent variable. A significant F-statistic indicates that the regression model offers a better fit to the data than a model without explanatory variables, thereby confirming the overall validity of the estimated regression equation.

Table 12. ANOVA

Source	F	Sig.
Regression	46.35	0.000

The ANOVA results indicate that the regression model is statistically significant, as evidenced by an F-statistic of 46.35 with a significance value of 0.000, which is well below the 5% significance level. This finding demonstrates that the regression model provides a meaningful explanation of the variation in provincial PDRB per capita and confirms that the EV-DCI score significantly contributes to predicting regional economic performance. The statistically significant F-test also supports the overall adequacy of the regression model, indicating that the estimated relationship between digital economy competitiveness and regional economic development is unlikely to have occurred by chance. Consequently, the model is considered appropriate for hypothesis testing and for explaining the influence of digital economy readiness on economic prosperity across Indonesian provinces.

t-Test

The t-test was conducted to examine the partial effect of the independent variable, namely the EV-DCI score, on provincial PDRB per capita. This test evaluates whether the estimated regression coefficient differs significantly from zero, thereby determining whether digital economy competitiveness exerts a statistically significant influence on

regional economic performance. The decision to accept or reject the research hypothesis is based on the significance value at the 5% confidence level.

Table 13. Hypothesis Testing

Variable	t	Sig.	Decision
EV-DCI	6.808	0.000	Accepted

The hypothesis testing results demonstrate that the EV-DCI variable has a t-statistic of 6.808 with a significance value of 0.000, which is substantially lower than the 5% significance threshold. This finding indicates that digital economy competitiveness has a positive and statistically significant effect on provincial PDRB per capita. The positive regression coefficient suggests that improvements in digital economy readiness are associated with higher levels of regional economic performance, supporting the theoretical expectation that digital transformation enhances productivity, innovation, and economic efficiency. Accordingly, the research hypothesis is accepted, providing empirical evidence that the development of digital economy capabilities constitutes a significant determinant of regional economic competitiveness across Indonesian provinces.

DISCUSSION

Digital Economy Readiness as a Driver of Regional Competitiveness

The empirical findings demonstrate that digital economy readiness exerts a statistically significant and positive influence on regional competitiveness across Indonesian provinces. The regression analysis indicates that EV-DCI explains 58.4% of the variation in provincial PDRB per capita, suggesting that digital readiness has evolved into one of the principal structural determinants of regional economic performance rather than merely functioning as a complementary technological resource. This finding reinforces the growing body of literature arguing that digital transformation has become a fundamental source of productivity enhancement, innovation diffusion, and regional economic resilience in emerging economies (Ordóñez de Pablos, 2024; Ha & Chuah, 2023). Consequently, provinces exhibiting higher levels of digital preparedness possess greater capacity to transform technological resources into sustainable economic value creation, thereby strengthening their long-term competitive position.

The positive relationship identified in this study also confirms that digital readiness should be interpreted as a multidimensional capability encompassing digital infrastructure, institutional preparedness, digital literacy, technological adoption, and organizational adaptability rather than solely reflecting internet accessibility. Previous investigations in Indonesia similarly emphasize that disparities in digital readiness originate from unequal development of digital ecosystems across provinces, producing heterogeneous economic outcomes (Jaya et al., 2024; Jaya et al., 2026). Comparable evidence from Thailand indicates that regional competitiveness increasingly depends upon comprehensive digital preparedness integrating infrastructure, governance quality, and workforce capability rather than isolated technological investments (Jongwanich, 2023). Therefore, the present findings strengthen the regional digital development perspective by demonstrating that provinces capable of integrating these multiple dimensions generate stronger economic performance.

Another important implication emerging from the regression model concerns the strategic role of digital readiness in accelerating productivity spillovers across regional economic sectors. Higher EV-DCI scores are likely associated with greater adoption of digital production systems, improved coordination among economic actors, faster information exchange, and more efficient resource allocation throughout provincial economies. Prakosa et al. (2024) similarly reported that Industry 4.0 readiness contributes substantially to socioeconomic development through stronger industrial capability and demographic adaptation, while Aldhi et al. (2025) found that managerial digital readiness significantly enhances governance performance within smart city ecosystems. These complementary findings suggest that regional competitiveness does not emerge from isolated technological implementation but rather from systemic interactions among digital capability, institutional quality, and organizational readiness.

The present results further imply that the digital economy increasingly functions as a regional development platform capable of integrating entrepreneurship, innovation, financial inclusion, and industrial modernization into a unified growth mechanism. Studies on Indonesian MSMEs reveal that successful digital transformation requires interconnected ecosystems involving digital platforms, government support, business collaboration, and innovation networks rather than individual firm-level adoption alone (Anatan & Nur, 2023; Aminullah et al., 2024). Similar arguments have been advanced by Idrus (2024), Sudirman (2025), and Wahyuningtyas et al. (2023), who demonstrate that digital transformation substantially improves organizational competitiveness by expanding market access, strengthening innovation capability, and improving operational efficiency. Accordingly, the positive coefficient obtained in this study reflects cumulative regional effects generated through the interaction of multiple digital economic components instead of isolated technological investments.

From a broader theoretical perspective, these findings support the proposition that regional competitiveness in developing economies has entered a new development paradigm characterized by digital capability accumulation as a primary source of comparative advantage. Traditional development factors—including natural resources, geographical location, and physical infrastructure—remain important; however, they are increasingly complemented by digital assets, technological knowledge, and institutional adaptability that determine regional productivity under digital economic transformation. This interpretation aligns with contemporary regional competitiveness theories emphasizing innovation capacity, digital governance, and knowledge-based development as central drivers of sustainable economic growth (Suranto et al., 2026; Vinod Kumar, 2026). Therefore, the significant statistical relationship identified in this study should be interpreted not merely as evidence of technological adoption but as confirmation that digital economy readiness has become a strategic foundation for sustaining regional competitiveness within Indonesia's rapidly evolving digital economic landscape.

Digital Ecosystem Maturity and Regional Economic Performance

The robustness of the statistical model strengthens confidence that the observed relationship between digital economy readiness and regional competitiveness reflects a genuine structural phenomenon rather than a statistical artifact. The fulfillment of the assumptions of normality, linearity, homoscedasticity, and the absence of autocorrelation indicates that the estimated regression coefficient provides a reliable representation of the interaction between EV-DCI and provincial economic performance. Beyond statistical adequacy, these diagnostic results imply that digital readiness consistently contributes to economic outcomes across provinces despite considerable socioeconomic diversity. Such consistency supports the broader argument that digital transformation has become an institutional driver of regional development throughout Southeast Asia rather than a localized phenomenon limited to highly developed regions (Ha & Chuah, 2023; Suranto et al., 2026).

The strong Pearson correlation coefficient ($r = 0.764$) further suggests that improvements in digital readiness are accompanied by proportional improvements in regional competitiveness across Indonesia. Rather than reflecting isolated technological investments, this relationship illustrates the cumulative influence of interconnected digital infrastructure, human capital, institutional governance, innovation capability, and market accessibility. Jaya et al. (2024) demonstrated that the Indonesian Digital Society Index exhibits clear spatial clustering, indicating that provinces with stronger digital ecosystems tend to experience cumulative socioeconomic advantages over time. Likewise, Jaya et al. (2026) revealed that regional disparities in digital skills significantly shape unequal economic opportunities, emphasizing that human capital remains an indispensable component of digital competitiveness alongside technological infrastructure.

An important implication emerging from the present findings concerns the complementary relationship between technological readiness and workforce capability. Digital infrastructure alone cannot generate sustained economic growth unless accompanied by sufficient digital competencies that enable individuals, firms, and public institutions to utilize emerging technologies effectively. This interpretation is supported by Isbah et al. (2026), who argue that vocational education reforms remain essential for preparing labor markets capable of adapting to rapidly evolving digital industries. Similar conclusions are presented by Basalamah (2026), Putra and Idrus (2026a), Putra and Idrus (2026b), and Suhada et al. (2026), all of whom emphasize that digital literacy, technological readiness, work preparedness, and digital self-efficacy collectively determine the effectiveness of digital transformation initiatives.

The findings also indicate that institutional readiness constitutes an equally important component of regional competitiveness. Provinces demonstrating stronger digital performance are likely characterized by more adaptive public governance, higher administrative efficiency, and greater capacity to coordinate digital transformation across multiple economic sectors. Aldhi et al. (2025) found that managerial digital readiness significantly mediates smart city governance performance, while Chong et al. (2026) reported that coherent digital policy frameworks substantially improve national economic performance through integrated digital infrastructure development. Similar institutional perspectives are reinforced by Herani (2026), who highlighted the importance of regulatory effectiveness for entrepreneurial readiness, and by Pratama (2026), whose analysis of smart city implementation illustrates how governance quality determines the sustainability of urban digital transformation.

From a regional development perspective, the present results indicate that digital economy readiness should be interpreted as a dynamic ecosystem rather than a collection of independent technological indicators. Digital competitiveness emerges from continuous interaction among technological infrastructure, skilled human resources, adaptive institutions, supportive public policies, innovation ecosystems, and collaborative governance mechanisms operating simultaneously across regions. This interpretation is consistent with the ecosystem approach proposed by Aminullah et al. (2024), the innovation-driven competitiveness framework advanced by Ordóñez de Pablos (2024), and recent bibliometric evidence demonstrating that digitalization increasingly represents an integrated multidisciplinary development paradigm throughout Southeast Asia (Suranto et al., 2026). Consequently, the statistical robustness observed in this study provides empirical support for the proposition that strengthening regional

competitiveness requires comprehensive ecosystem development rather than fragmented investments in individual digital sectors.

MSME Digital Transformation and Inclusive Regional Growth

The positive relationship identified between digital economy readiness and regional competitiveness also underscores the increasingly strategic role of Micro, Small, and Medium Enterprises (MSMEs) in translating digital capabilities into inclusive economic growth. Provinces with stronger digital readiness generally provide more supportive ecosystems for MSMEs to adopt digital technologies, expand market access, and improve productivity, thereby contributing to higher regional economic performance. The EV-DCI framework implicitly captures this ecosystem through dimensions related to digital infrastructure, innovation, and ecosystem maturity, all of which facilitate business digitalization. These findings are consistent with previous studies emphasizing that MSME digital transformation constitutes one of the principal mechanisms linking digital readiness with sustainable regional development (Anatan & Nur, 2023; Aminullah et al., 2024; Idrus, 2024).

Beyond improving operational efficiency, digital transformation enables MSMEs to participate more actively in broader digital value chains through e-commerce, digital payment systems, cloud-based management platforms, and online business networks. Such technological integration reduces transaction costs, increases production flexibility, and expands customer reach beyond local markets, thereby enhancing firm competitiveness while simultaneously strengthening regional economic resilience. Recent empirical evidence further demonstrates that innovation capability, digital adoption, and financial inclusion operate synergistically in improving MSME performance and promoting more inclusive economic development throughout Indonesia (Khan et al., 2026; Hao et al., 2026; Wulandari et al., 2026). Likewise, Anggraeni et al. (2026) demonstrate that e-commerce adoption mediates the relationship between MSME digitalization and regional economic development, suggesting that digital platforms increasingly function as catalysts for inclusive growth rather than merely alternative marketing channels.

Another important implication concerns the role of organizational capability in determining whether digital technologies generate meaningful economic outcomes. Digital infrastructure alone cannot guarantee higher competitiveness unless business actors possess sufficient digital literacy, entrepreneurial capability, and adaptive capacity to utilize available technologies effectively. Studies by Lukita et al. (2026) indicate that higher digital maturity enables MSMEs to achieve more sustainable business growth, while Herdiyeni et al. (2026) demonstrate that data-driven digital transformation assessment can improve strategic decision-making among Indonesian enterprises. Complementary evidence from Safitri et al. (2026), Sutardi et al. (2026), and Panjaitan et al. (2026) further emphasizes that leadership quality, organizational learning orientation, innovation capability, and entrepreneurial training collectively determine the long-term success of MSME digital transformation initiatives.

The empirical findings also indicate that digital transformation contributes substantially to reducing regional development disparities by creating more equal economic opportunities across provinces. Digital platforms enable businesses located in less-developed regions to access broader markets without being constrained by geographical distance, thereby increasing participation in national and international economic networks. This interpretation is reinforced by Amin et al. (2026), who argue that digital platform adoption significantly enhances the participation of informal-sector enterprises in Indonesia's digital economy, while Juita et al. (2026) show that digital market adoption among underserved MSMEs depends strongly on self-efficacy and institutional trust. Similarly, Sumiati et al. (2026) and Wahyudin et al. (2026) highlight that digital financial literacy and entrepreneurial competencies strengthen the sustainability of MSMEs by improving financial management, business resilience, and long-term competitiveness within local economies.

From a broader regional development perspective, the present findings suggest that MSME digital transformation should be viewed not simply as a technological upgrading process but as an inclusive development strategy capable of generating widespread socioeconomic benefits. The positive association between digital readiness and regional competitiveness indicates that provinces investing in digital ecosystems simultaneously create favorable conditions for entrepreneurship, employment creation, innovation diffusion, and income generation across diverse economic sectors. Consequently, strengthening MSME digital transformation requires integrated policies encompassing digital infrastructure expansion, human capital development, financial inclusion, innovation support, and collaborative partnerships among government, industry, academia, and local communities. Such an ecosystem-oriented approach is likely to produce more balanced regional development while enhancing Indonesia's long-term competitiveness within the rapidly evolving digital economy (Aminullah et al., 2024; Khan et al., 2026; Wulandari et al., 2026; Herdiyeni et al., 2026).

Policy Implications and Sustainable Regional Competitiveness

The empirical findings indicate that strengthening regional competitiveness requires policy interventions that extend beyond the provision of digital infrastructure alone. While the regression results confirm that digital economy

readiness significantly contributes to provincial economic performance, the sustainability of this relationship depends on the ability of governments to establish integrated digital governance systems that encourage innovation, investment, and inclusive economic participation. Consequently, digital transformation policies should be formulated as comprehensive regional development strategies rather than isolated information technology initiatives. This perspective is consistent with recent evidence demonstrating that coordinated digital policy frameworks substantially enhance economic growth by integrating infrastructure development, regulatory reform, and institutional capacity building (Chong et al., 2026; Pratama, 2026; Vinod Kumar, 2026).

Another important policy implication concerns the necessity of improving regulatory quality and institutional effectiveness to maximize the benefits of digital transformation. Provinces with stronger digital readiness are more likely to attract investment, encourage business innovation, and facilitate entrepreneurship when supported by adaptive regulatory environments that reduce administrative barriers and promote technological adoption. In contrast, fragmented governance structures and inconsistent regulations may limit the economic benefits generated by digital infrastructure despite substantial technological investment. Previous studies similarly argue that regulatory effectiveness, government support, and adaptive policy frameworks represent fundamental prerequisites for sustainable digital entrepreneurship and regional competitiveness, particularly in emerging economies undergoing rapid technological change (Herani, 2026; Nurcahyo & Wardani, 2026; Kasmita et al., 2026).

The findings further emphasize that sustainable regional competitiveness depends on the integration of digital transformation with broader economic, social, and environmental development objectives. Digitalization should therefore be implemented alongside initiatives that promote resource efficiency, resilient supply chains, financial sustainability, and responsible innovation. Such integration enables provinces to generate long-term economic value while maintaining environmental sustainability and social inclusiveness. This interpretation is supported by studies showing that digital transformation improves organizational sustainability performance, strengthens sustainable financial governance, enhances supply-chain resilience, and increases the efficiency of natural resource utilization within rapidly digitalizing economies (Suparman et al., 2026; Lestari et al., 2026; Kosasih et al., 2026; Ma et al., 2026).

From the perspective of regional development, future public policies should prioritize collaboration among government institutions, universities, industries, financial institutions, and local communities to accelerate digital ecosystem development across all provinces. Such collaborative governance mechanisms can reduce regional digital disparities by expanding digital infrastructure, strengthening innovation ecosystems, and improving workforce capabilities simultaneously. Moreover, inclusive policy implementation should ensure that digital transformation benefits not only technologically advanced provinces but also less-developed regions with limited digital capacity. Evidence from recent studies suggests that cross-sector partnerships, ethical digital innovation, and community-based economic development substantially improve the effectiveness and inclusiveness of regional digital transformation strategies (Abrar & Sari, 2026; Purwati et al., 2026; Syaripuddin et al., 2026; Muchsam et al., 2026).

Overall, the present study reinforces the argument that digital economy readiness has become a strategic pillar of sustainable regional competitiveness in Indonesia. The significant relationship between EV-DCI and provincial economic performance demonstrates that investments in digital capability generate broader socioeconomic returns when accompanied by effective governance, skilled human resources, innovation-oriented institutions, and supportive policy environments. Accordingly, future regional development strategies should adopt a holistic digital ecosystem approach that simultaneously strengthens technological infrastructure, institutional quality, entrepreneurial capacity, sustainability practices, and intersectoral collaboration. Through such an integrated framework, Indonesia will be better positioned to reduce regional disparities, accelerate inclusive economic growth, and strengthen its long-term competitiveness within the increasingly interconnected global digital economy.

CONCLUSION

This study demonstrates that digital economy readiness has become an increasingly important strategic foundation for strengthening regional competitiveness in Indonesia. Rather than functioning solely as a technological indicator, digital readiness represents a multidimensional capability encompassing digital infrastructure, human capital, institutional preparedness, innovation ecosystems, and business digitalization that collectively support sustainable regional economic development. The findings suggest that provinces capable of integrating these complementary dimensions are better positioned to foster productive economic activities, improve innovation capacity, and create more resilient regional economies within the rapidly evolving digital landscape.

The study also provides important theoretical and practical implications. From a theoretical perspective, it reinforces the growing body of knowledge that regional competitiveness should be understood through a digital ecosystem perspective in which technology, institutions, human resources, and innovation interact simultaneously to generate sustainable economic value. From a practical perspective, the findings highlight the importance of designing integrated digital development policies that simultaneously strengthen digital infrastructure, improve digital literacy, promote MSME digital transformation, enhance institutional quality, and encourage collaboration among

governments, businesses, universities, and local communities. Such an integrated approach is expected to reduce regional disparities while supporting more inclusive and sustainable economic growth across Indonesian provinces.

Despite these contributions, several limitations should be acknowledged. The study relied exclusively on secondary cross-sectional data representing provincial conditions during a single observation period, limiting the ability to examine dynamic changes in digital competitiveness over time. In addition, regional competitiveness was represented primarily through provincial economic performance, whereas other important dimensions, such as innovation outputs, environmental sustainability, governance quality, industrial sophistication, and social welfare, were not incorporated into the empirical model. Consequently, the findings should be interpreted within the context of the selected indicators and available provincial data.

Future research is encouraged to employ longitudinal or panel datasets to investigate the long-term effects of digital economy readiness on regional development trajectories. Subsequent studies may also integrate additional explanatory variables, including innovation capability, institutional quality, environmental sustainability, investment climate, digital governance, financial inclusion, and industrial digitalization, while adopting more advanced analytical techniques such as structural equation modeling, spatial econometric analysis, or multilevel modeling. Comparative studies involving other ASEAN countries would further enrich the understanding of regional digital competitiveness within broader international contexts.

Finally, this study contributes to the wider public by providing empirical evidence that digital transformation extends beyond technological modernization and constitutes an essential instrument for achieving inclusive regional development. The findings offer valuable insights for policymakers in formulating evidence-based digital policies, for local governments in prioritizing strategic investments, for businesses and MSMEs in accelerating digital adoption, and for academics in advancing future research on digital competitiveness. More broadly, the study supports Indonesia's ongoing efforts to foster balanced regional development and strengthen national competitiveness in the increasingly interconnected global digital economy.

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AI DISCLOSURE STATEMENT

Artificial Intelligence (AI), specifically ChatGPT developed by OpenAI, was used solely to assist with language editing, grammar refinement, sentence restructuring, and the improvement of academic writing clarity during the preparation of this manuscript. The AI tool also supported the organization of ideas and formatting of the manuscript in accordance with scholarly writing conventions.

AI was not used to generate research data, conduct statistical analyses, perform literature selection, collect or interpret empirical evidence, formulate research findings, or draw the study's conclusions. All aspects of the research process, including the research design, data collection, data analysis, interpretation of results, and final academic judgments, were independently conducted, verified, and approved by the author. The author assumes full responsibility for the accuracy, originality, integrity, and scientific content of this manuscript.

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