International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Digital Literacy as a Strategic Moderator: Unlocking MSME Revenue Potential in the Digital Economy

Indah Fitriana Sari[1], Muhammad Rafi'i Sanjani[2]

[1,2]Sumbawa University of Technology, Sumbawa Regency, West Nusa Tenggara, Indonesia

E-mail Address: indah.fitriana.sari@uts.ac.id [1], muhammad.rafii.sanjani@uts.ac.id [2]

Abstract

The proliferation of the digital economy has created significant opportunities for micro, small, and medium enterprises (MSMEs) to expand their market reach and increase revenue. However, the utilization of digital platforms in business activities remains uneven, particularly in rural areas such as Sumbawa Regency. This study aims to analyze the effect of the digital economy on MSME revenue and to examine the moderating role of digital literacy in this relationship. A quantitative approach with PLS-SEM (Partial Least Squares-Structural Equation Modeling) was employed, using SmartPLS 4 software. The sample consisted of 100 MSME actors in Sumbawa Regency who actively use the internet for business promotion and transactions. Data were collected through structured questionnaires with a Likert scale. The results indicate that: (1) the digital economy has a significant positive effect on MSME revenue (β = 0.427; t = 5.312; p < 0.001); (2) digital literacy has a significant positive effect on MSME revenue (β = 0.318; t = 3.874; p < 0.001); and (3) digital literacy significantly moderates the relationship between the digital economy and MSME revenue (β = 0.241; t = 2.896; p = 0.004). These findings confirm that digital literacy strengthens the positive impact of the digital economy on MSME revenue. The study implies that digital literacy enhancement programs are essential to optimize the benefits of the digital economy for MSMEs in underdeveloped regions.

Keywords: Digital Economy; MSME Revenue; Digital Literacy; PLS-SEM.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

INTRODUCTION

The development of information and communication technology over the past two decades has fundamentally transformed the global economic landscape. The emergence of the digital economy, which encompasses all economic activities utilizing internet networks, digital platforms, and data-driven technologies, has opened a new dimension for business growth across all scales, including micro, small, and medium enterprises (MSMEs) (Tapscott, 1995; Chaffey & Ellis-Chadwick, 2019). Indonesia, as the country with the fourth-largest number of internet users globally, is one of the most dynamic digital markets in the Southeast Asian region. As of 2022, more than 210 million Indonesians were connected to the internet, and the growth of e-commerce recorded a highly significant figure (Ministry of Communication and Information Technology, 2022).

MSMEs play a strategic role in the Indonesian economy. Based on data from the Ministry of Cooperatives and SMEs (2023), the MSME sector contributes more than 61% to the national Gross Domestic Product (GDP) and absorbs approximately 97% of the total workforce. Given such a substantial contribution, enhancing the competitiveness of MSMEs has become a priority agenda for economic development that cannot be ignored. One of the strategies believed to be capable of improving MSME competitiveness is through the adoption of digital technology and the integration of businesses into the digital economy ecosystem (Arianto, 2020; Haryanti & Subriadi, 2020).

Sumbawa Regency, as one of the regencies in West Nusa Tenggara Province, possesses a relatively large and diverse MSME base, ranging from the trade, culinary, and handicraft sectors to services. However, the utilization of digital platforms by MSME actors in this region remains relatively low compared to the national average. This condition is influenced by various factors, including limited digital infrastructure, the low digital literacy skills of business actors, and a lack of understanding regarding the economic benefits of technology adoption (Central Bureau of Statistics of Sumbawa Regency, 2023; Maulana & Kurniawan, 2022).

Several previous studies have identified the positive effect of the digital economy on MSME performance (Rahayu & Day, 2015; Mutakin & Fahmi, 2021; Ambarini et al., 2023). Nevertheless, numerous studies also indicate that this effect is not always consistent and is highly conditional. This implies that the ability of MSME actors to capitalize on digital opportunities depends heavily on individual capacities to operate, understand, and utilize digital technology optimally a concept known in academic literature as digital literacy (Puspitasari & Ishii, 2016; Febriyanti et al., 2023).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

The digital divide that occurs in many remote and developing areas has become a tangible barrier in the digital transformation process of MSMEs (Çilan et al., 2009; Indrawati et al., 2021). Digital literacy, defined as an individual's ability to access, evaluate, and use digital information effectively and responsibly (Ministry of Communication and Information Technology, 2022), serves as a compelling moderating variable to examine in this context. The Diffusion of Innovations Theory (Rogers, 2003) asserts that the successful adoption of technological innovation is not solely determined by the availability of the technology itself, but also by the capacity of individuals or groups to understand and implement it. In the context of MSMEs, business actors with high digital literacy are expected to be capable of optimizing the use of digital platforms, thereby generating a greater impact on revenue.

This study is motivated by several research gaps that need to be bridged. First, studies on the effect of the digital economy on MSME revenue with digital literacy as a moderator are still very limited, particularly in the context of archipelagic regions or eastern Indonesia, such as Sumbawa Regency. Second, the majority of existing research focuses more on the direct effects of technology adoption without considering the role of individual capability as a factor that strengthens or weakens this relationship. Third, the use of the PLS-SEM method combined with moderation analysis in the context of MSMEs in developing regions is rarely explored in depth. Therefore, this study is expected to provide meaningful empirical and theoretical contributions, particularly for the development of digital-based MSME empowerment policies.

LITERATURE REVIEW

Theoretical Foundation

This study is anchored on two complementary theoretical pillars that collectively explain the mechanisms through which digital economy participation translates into MSME revenue outcomes, conditioned by individual digital capabilities.

The Diffusion of Innovations Theory (Rogers, 2003) provides the foundational framework for understanding technology adoption among MSME actors. Rogers posits that the successful diffusion of technological innovations depends on five key attributes: relative advantage, compatibility, complexity, trialability, and observability. In the MSME context, digital platforms and e-commerce systems represent innovations whose adoption is influenced by perceived benefits relative to traditional business practices (relative advantage), alignment with existing business operations (compatibility), and ease of learning and use (complexity). Crucially, Rogers emphasizes that adoption is not

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

a binary event but a process involving knowledge acquisition, persuasion, decision-making, implementation, and confirmation each stage requiring progressively sophisticated digital competencies. This theoretical lens explains why simply providing digital infrastructure is insufficient; MSME actors must traverse the entire adoption continuum, and their capacity to do so is fundamentally shaped by their digital literacy levels. The theory further suggests that early adopters, who typically possess higher technological aptitude, derive disproportionate benefits from innovations, creating an adoption gap that digital literacy interventions are designed to close.

The Technology Acceptance Model (TAM), developed by Davis (1989), offers a complementary micro-level framework that explains individual technology acceptance and usage behavior. TAM posits that behavioral intention to use technology is determined by two primary cognitive responses: perceived usefulness (the degree to which a person believes that using a particular system would enhance their job performance) and perceived ease of use (the degree to which a person believes that using a particular system would be free of effort). In the MSME revenue context, digital literacy operates as an antecedent that significantly enhances perceived ease of use by reducing the cognitive friction associated with navigating digital platforms, understanding analytical dashboards, and troubleshooting technical issues. When MSME actors possess higher digital literacy, their perception of ease of use improves, which subsequently strengthens their perception of usefulness because they can actually realize the functional benefits rather than being frustrated by technical barriers. TAM further incorporates external factors such as social influence and facilitating conditions, which are particularly relevant in collectivist Indonesian contexts where peer networks and government training programs shape technology adoption patterns. The model suggests that perceived usefulness will translate into actual usage behavior only when perceived ease of use is sufficiently high, thereby establishing digital literacy as a critical enabling condition.

These two theories converge in explaining why digital literacy functions as a moderator rather than merely a direct antecedent. Diffusion of Innovations Theory explains the adoption process and the capability requirements at each stage, while TAM explains the cognitive mechanisms through which digital literacy shapes perceptions and subsequent usage intensity. When integrated, they provide a robust theoretical rationale for the moderation hypothesis: MSME actors who possess higher digital literacy will perceive digital platforms as more useful and easier to use, will progress more effectively through the adoption stages, and will consequently derive greater revenue benefits from digital economy participation.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

The Digital Economy and MSME Revenue

The relationship between digital economy engagement and MSME financial performance has been extensively investigated, with consistent evidence of positive effects across diverse geographic and sectoral contexts. The digital economy encompasses economic activities leveraging internet networks, digital platforms, and data-driven technologies to create, distribute, and capture value (Tapscott, 1995; Chaffey & Ellis-Chadwick, 2019). For MSMEs, the digital economy manifests through e-commerce platforms, social media commerce, digital payment systems, and online marketplace participation.

Rahayu & Day (2015) provided foundational evidence from the Indonesian context, demonstrating that e-commerce adoption significantly enhances SME performance through expanded market access and operational efficiency gains. Their research, surveying 204 Indonesian SMEs, identified that perceived benefits, organizational readiness, and external pressure jointly determine adoption intensity, with performance improvements most pronounced among SMEs that integrate digital channels comprehensively rather than sporadically. Mutakin & Fahmi (2021) extended these findings using panel data from Indonesian MSMEs, showing that digital economy participation correlates with 15-20% higher revenue growth compared to non-adopting counterparts, with the effect strongest in trade and service sectors.

Susanto & Sucahyo (2023) investigated the comprehensive utilization of the digital ecosystem among Indonesian MSMEs and found that platform diversity using multiple e-commerce marketplaces, social media channels, and digital payment options is positively correlated with turnover and profitability increases. Their study emphasized that MSMEs achieving "digital ecosystem integration," where platforms interconnect to create seamless customer journeys, realize substantially greater benefits than those using single channels. Oktavia & Wulandari (2022) specifically examined MSMEs on Lombok Island, Indonesia, and found that e-commerce adoption significantly predicts revenue increases ($\beta = 0.392$, $p < 0.01$), with the effect moderated by digital literacy a finding highly relevant to the current study's context. At the international level, Akter & Wamba (2016) conducted a systematic review of big data analytics in e-commerce and concluded that data-driven digital strategies enable SMEs to achieve competitive advantage through customer insight generation, personalized marketing, and supply chain optimization. Abou-Shouk & Khalifa (2017) demonstrated in the Egyptian tourism sector that website quality dimensions information quality, system quality, and service quality significantly influence e-purchasing behavior and e-loyalty, contributing to sustained revenue streams.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

From a theoretical perspective, these findings align with the Diffusion of Innovations framework, MSMEs that adopt digital innovations early and comprehensively realize relative advantages through cost efficiency, market expansion, and enhanced customer relationships. The relationship, however, is conditional not all MSMEs derive equal benefits, and the magnitude of effect depends on internal capabilities, sectoral characteristics, and the broader digital ecosystem.

Digital Literacy and MSME Performance

Digital literacy, conceptualized as the individual's ability to access, evaluate, utilize, and create digital information effectively and responsibly (Ministry of Communication and Information Technology, 2022), has emerged as a critical determinant of MSME performance in the digital era. The construct extends beyond basic operational skills to encompass digital marketing proficiency, data analysis capabilities, cybersecurity awareness, and content creation competencies.

Febriyanti et al. (2023) conducted PLS-SEM analysis on Indonesian MSMEs and found that digital literacy directly and positively affects sales turnover, with marketplace utilization serving as a partial mediator. Their study documented that MSME actors with high digital literacy achieve 28% higher sales than those with low literacy levels, even controlling for business age, sector, and initial capital. The effect was particularly pronounced among MSMEs in rural areas, suggesting that digital literacy compensates for geographic disadvantages by enabling remote market access and digital promotion.

Puspitasari & Ishii (2016) examined the digital divide in Indonesia and identified that digital literacy disparities not just infrastructure access constitute the primary barrier to meaningful technology utilization. Their research demonstrated that smartphone ownership alone does not guarantee digital engagement; individuals without functional digital literacy use mobile internet primarily for entertainment rather than productive economic activities. This finding has profound implications for MSME policy, indicating that device distribution programs without accompanying literacy training yield limited economic returns.

Wahyuni et al. (2022) specifically investigated MSMEs in Sumbawa Besar, providing a direct contextual parallel to the current study. Their survey of culinary MSME actors found that digital literacy, operationalized as technology usage skills, digital marketing skills, and digital content literacy, significantly predicts business performance ($R^2 = 0.432$, $p < 0.001$). The study emphasized that MSMEs whose owners possess higher digital literacy are more likely to adopt diverse digital marketing strategies, manage

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

online customer relationships effectively, and leverage transaction data for business decision-making.

RESEARCH METHODOLOGY

Research Design and Approach

This study employs a quantitative approach with an explanatory research design, aiming to explain the causal relationships among the examined variables through hypothesis testing. The analytical method used is Partial Least Squares-Structural Equation Modeling (PLS-SEM) assisted by SmartPLS 4 software (Ringle et al., 2022). PLS-SEM was selected because of its variance-based nature, which does not require strict normal distribution assumptions, its ability to handle relatively small sample sizes, and its suitability for predictive and exploratory models (Hair et al., 2019; Ghozali, 2021).

Population and Sample

The population in this study comprises all MSME actors registered with the Department of Cooperatives, Industry, and Trade of Sumbawa Regency who actively utilize the internet as a medium for business promotion and transactions. Based on data from the relevant department, there are approximately 1,200 MSMEs that meet these criteria. Sampling was conducted using a purposive sampling technique with the following inclusion criteria: (1) the MSME has been operating for at least one year; (2) the owner or manager utilizes at least one digital platform in business operations; and (3) willingness to be a research respondent. Referring to the recommendation by Hair et al. (2019) for PLS-SEM that the minimum sample size should be 10 times the largest number of indicators in a single construct and considering data representativeness, 100 respondents were determined as an adequate sample size for this study.

Research Variables and Instruments

This study involves three variables: (1) Digital Economy (X) as the exogenous/independent variable, (2) MSME Revenue (Y) as the endogenous/dependent variable, and (3) Digital Literacy (M) as the moderating variable. Each variable was measured using five reflective indicators developed based on a literature review and adapted to the context of MSMEs in Sumbawa Regency.

The Digital Economy (X) variable was developed referring to Chaffey & Ellis-Chadwick (2019) and Akter & Wamba (2016), encompassing the following indicators: use

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

of digital platforms, frequency of online transactions, utilization of e-commerce, use of business social media, and utilization of digital payment systems.

The Digital Literacy (M) variable was developed based on the Ministry of Communication and Information Technology (2022) and Puspitasari & Ishii (2016), including: technology usage skills, digital marketing skills, digital data analysis skills, digital security, and digital content literacy.

The MSME Revenue (Y) variable was developed referring to Tambunan (2019) and Bakry & Puspita (2022), which includes: total sales turnover, revenue growth, market share expansion, business profitability, and operational cost efficiency.

The measurement instrument utilized a questionnaire with a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Before the full data collection, a pilot test of the instrument was conducted on 30 respondents outside the main sample to ensure the readability and consistency of the statement items.

Data Collection Techniques

Data collection was carried out during the October–November 2023 period through face-to-face surveys and the distribution of online questionnaires using Google Forms to respondents scattered across various sub-districts in Sumbawa Regency. The distribution of questionnaires was accompanied by trained field officers to minimize respondents' misunderstanding of the research statements (Noe et al., 2021).

Data Analysis Techniques using PLS-SEM

Data analysis using PLS-SEM was conducted in two main stages: outer model evaluation (measurement model) and inner model evaluation (structural model). During the measurement model evaluation stage, construct validity was tested through convergent validity (outer loadings > 0.70 and Average Variance Extracted/AVE > 0.50), discriminant validity using the Heterotrait-Monotrait Ratio (HTMT < 0.85) criteria, and reliability using Composite Reliability (CR > 0.70) and Cronbach's Alpha (> 0.70) (Henseler et al., 2015; Fornell & Larcker, 1981).

The structural model evaluation included testing the path coefficients, R-squared (R^2) values, and Q-squared (Q^2) values as a measure of predictive relevance (Hair et al., 2022). Hypothesis testing was performed using a bootstrapping procedure with 5,000 resamples at a significance level of $\alpha = 5\%$ (Sarstedt et al., 2016). For moderation testing, the interaction variable was formed using the product indicator approach in SmartPLS 4 by building an interaction construct between the Digital Economy (X) and Digital Literacy

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

(M). This approach is consistent with the recommendation of Baron & Kenny (1986) in testing moderation effects through interactional regression analysis within the SEM framework. The moderation hypothesis is accepted if the interaction path coefficient (X×M → Y) is statistically significant ($p < 0.05$) (Ghozali, 2021).

RESULTS AND DISCUSSION

Respondent Profile

Descriptive Statistics of Research Variables

Table 1 presents a general overview of the descriptive statistics for all examined variables, including minimum, maximum, mean, and standard deviation values.

Table 1. Descriptive Statistics of Research Variables

Variable	N	Min.	Max.	Mean	Std. Dev.
Digital Economy (X)	100	1.80	5.00	3.87	0.712
Digital Literacy (M)	100	1.60	5.00	3.74	0.689
MSME Revenue (Y)	100	1.80	5.00	3.91	0.734

Source: Processed primary data, SmartPLS 4 (2026).

Table 1 shows that all three variables have a mean value above 3.70, which indicates that respondents generally provided a relatively positive assessment of all examined variables. The MSME Revenue (Y) variable has the highest mean value of 3.91, demonstrating that MSME actors who use the internet in their businesses perceive tangible benefits to their revenue. The Digital Economy (X) variable has a mean value of 3.87, indicating a fairly high intensity of digital platform utilization. Meanwhile, Digital Literacy (M) has the lowest mean value among the three, at 3.74, reflecting that the digital capabilities of MSME actors still have room for continuous improvement. The standard deviation values ranging from 0.689 to 0.734 indicate a moderate and non-extreme variation in responses, meaning the data can be considered homogeneous and representative.

Measurement Model Evaluation (Outer Model)

The results of the measurement model evaluation include testing convergent validity through the outer loading values of each indicator against its construct, as presented in Table 2 below.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 2. Validity Test Results (Outer Loadings)

Variable	Indicator	Outer Loading	Status
Digital Economy (X)	DE1 - Use of digital platforms	0.842	Valid
	DE2 - Frequency of online transactions	0.817	Valid
	DE3 - Utilization of e-commerce	0.871	Valid
	DE4 - Use of business social media	0.858	Valid
	DE5 - Utilization of digital payment	0.834	Valid
Digital Literacy (M)	DL1 - Technology usage skills	0.816	Valid
	DL2 - Digital marketing skills	0.829	Valid
	DL3 - Digital data analysis skills	0.847	Valid
	DL4 - Digital security	0.803	Valid
	DL5 - Digital content literacy	0.861	Valid
MSME Revenue (Y)	MR1 - Total sales turnover	0.879	Valid
	MR2 - Revenue growth	0.851	Valid
	MR3 - Market share expansion	0.838	Valid
	MR4 - Business profitability	0.867	Valid
	MR5 - Operational cost efficiency	0.843	Valid

Source: Processed primary data, SmartPLS 4 (2026).

Table 2 shows that all indicators of the three research variables have outer loading values above 0.70, ranging from 0.803 to 0.879. The highest value is held by the MR1 indicator (Total Sales Turnover) at 0.879 for the MSME Revenue variable, while the lowest value is held by the DL4 indicator (Digital Security) at 0.803 for the Digital Literacy variable. These results confirm that all indicators are convergently valid in measuring their intended constructs, in accordance with the established criteria (Henseler et al., 2015; Hair et al., 2019). The high outer loading values also indicate that each indicator contributes significantly to the measurement of its latent construct, so no indicators need to be eliminated from the model.

Furthermore, reliability and convergent validity testing through Composite Reliability (CR) and Average Variance Extracted (AVE) are presented in Table 3.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 3. Reliability and Convergent Validity Test Results

Variable	Cronbach's Alpha	CR	AVE
Digital Economy (X)	0.912	0.934	0.703
Digital Literacy (M)	0.903	0.927	0.718
MSME Revenue (Y)	0.921	0.941	0.731
Cut-off Value	> 0.70	> 0.70	> 0.50

Source: Processed primary data, SmartPLS 4 (2026).

Table 3 indicates that all research constructs have Cronbach's Alpha > 0.90 and Composite Reliability (CR) > 0.92, far exceeding the required minimum threshold of 0.70. This proves that the research instrument possesses a very high level of reliability (Ghozali, 2021). The Average Variance Extracted (AVE) values for all constructs are in the range of 0.703–0.731, well above the 0.50 threshold, validating that each construct is capable of explaining more than 70% of the variance of its indicators. Fulfilling this AVE criterion simultaneously confirms the establishment of convergent validity (Fornell & Larcker, 1981). The high AVE values also imply that the indicators used in this study consistently and accurately represent the measured latent constructs.

Discriminant validity testing using the Heterotrait-Monotrait Ratio (HTMT) approach is presented in Table 4.

Table 4. Discriminant Validity Test Results (HTMT)

Construct	Digital Economy	Digital Literacy	MSME Revenue
Digital Economy	-		
Digital Literacy	0.729	-	
MSME Revenue	0.684	0.713	-

Source: Processed primary data, SmartPLS 4 (2026).

Based on Table 4, all HTMT values between the construct columns are below the critical threshold of 0.85 recommended by Henseler et al. (2015). The HTMT value between Digital Economy and Digital Literacy is 0.729, between Digital Economy and

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

MSME Revenue is 0.684, and between Digital Literacy and MSME Revenue is 0.713. All these values consistently fall below 0.85, proving that each construct in this research model possesses uniqueness and is conceptually and empirically distinct (Henseler et al., 2015). The fulfillment of this discriminant validity confirms that the measurement model has successfully differentiated constructs that theoretically should be different, ensuring that the subsequent structural regression analysis is not disrupted by multicollinearity issues among the constructs.

Structural Model Evaluation (Inner Model) and Model Fit

After confirming that the measurement model is valid and reliable, the next step is the evaluation of the structural model to determine how well the model explains the data variation (Hair et al., 2022). Table 5 presents the model fit indicators and the predictive relevance of the model.

Table 5. Structural Model Evaluation and Model Fit Results

Fit Indicator	Result Value	Reference Value	Remarks
SRMR (Standardized Root Mean Square Residual)	0.061	< 0.08	Fit
NFI (Normed Fit Index)	0.913	> 0.90	Fit
R^2 Digital Economy → MSME Revenue	0.487	> 0.25 (moderate)	Good
R^2 with Digital Literacy Moderation	0.574	> 0.25 (moderate)	Good
Q^2 (Predictive Relevance) - Stone-Geisser	0.341	> 0	Good

Source: Processed primary data, SmartPLS 4 (2026).

Table 5 above shows highly satisfactory model fit evaluation results. The SRMR value of 0.061 is below the recommended threshold (< 0.08), indicating that the model has a good fit with empirical data (Henseler et al., 2015). The NFI value of 0.913 exceeds the 0.90 threshold, confirming that the overall research model possesses adequate structural quality for hypothesis testing. The R^2 value for the model without moderation of 0.487 indicates that the Digital Economy variable can explain 48.7% of the variance in MSME Revenue. This value is categorized as moderate to substantial according to Hair

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

et al. (2019). When the Digital Literacy variable and its interaction effect are included in the model, the R^2 value increases to 0.574, meaning the moderated model can explain 57.4% of the variance in MSME revenue. This 8.7 percentage point increase in R^2 substantively demonstrates that digital literacy provides meaningful additional explanatory power to the model. The Q^2 value of 0.341 (> 0) indicates that the model has good predictive relevance (Stone-Geisser criterion), meaning the model can be reliably used to predict MSME Revenue values.

Hypothesis Testing

Hypothesis testing was performed using a bootstrapping procedure with 5,000 resamples. The path coefficients test results, along with the test statistics and significance values, are presented in Table 6.

Table 6. Hypothesis Testing Results – Path Coefficients

H	Hypothesis Path	β	T-stat	P-value	Decision	Conclusion
H1	Digital Economy → MSME Revenue	0.427	5.312	0.000	Accepted	Sig.
H2	Digital Literacy → MSME Revenue	0.318	3.874	0.000	Accepted	Sig.
H3	Digital Economy × Digital Literacy → MSME Revenue (Moderation)	0.241	2.896	0.004	Accepted	Sig.

Source: Processed primary data, SmartPLS 4 (2026).

Table 6 presents the results of testing the three main research hypotheses. The first hypothesis (H1) tests the effect of the Digital Economy (X) on MSME Revenue (Y). The bootstrapping results show a path coefficient value $\beta = 0.427$ with a T-statistic of 5.312 and a p-value < 0.001. Because $p < 0.05$ and the T-statistic > 1.96, H1 is accepted. This implies that a higher intensity of utilizing the digital economy ecosystem by MSMEs leads to a higher revenue generated. The positive coefficient of 0.427 indicates a fairly strong and unidirectional relationship between the two variables.

The second hypothesis (H2) examines the direct effect of Digital Literacy (M) on MSME Revenue (Y). The analysis results yield $\beta = 0.318$ with a T-statistic of 3.874 and a p-value < 0.001. H2 is accepted, meaning that digital literacy independently contributes

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

positively and significantly to the increase in MSME revenue, regardless of the digital economy effect. MSME actors with higher digital capabilities tend to be able to manage their businesses more efficiently and capitalize on digital opportunities more effectively.

The third hypothesis (H3), which is a moderation hypothesis, tests whether Digital Literacy (M) moderates the relationship between the Digital Economy (X) and MSME Revenue (Y). The test results yield β = 0.241 with a T-statistic of 2.896 and a p-value = 0.004. H3 is accepted, indicating that Digital Literacy is statistically proven to strengthen (positively moderate) the relationship between the Digital Economy and MSME Revenue. The moderation effect of 0.241 shows that for MSME actors with a higher level of digital literacy, the impact of utilizing the digital economy on revenue becomes larger and more optimal.

DISCUSSION

The Effect of the Digital Economy on MSME Revenue

The findings of this study confirm that the Digital Economy has a positive and significant effect on MSME Revenue in Sumbawa Regency (β = 0.427; p < 0.001), thus H1 is accepted. These findings are in line with a number of previous studies showing the positive impact of digital platform adoption on the financial performance of MSMEs (Rahayu & Day, 2015; Mutakin & Fahmi, 2021; Oktavia & Wulandari, 2022). Theoretically, this can be explained through the framework of the Diffusion of Innovations Theory (Rogers, 2003), which posits that the successful adoption of technological innovations provides relative advantages in the form of increased efficiency, expanded market access, and ultimately, increased revenue.

From a micro perspective, MSME actors who actively utilize e-commerce, business social media, and digital payment systems in Sumbawa Regency report a tangible increase in consumer reach and transaction volume. The use of marketplace platforms such as Tokopedia, Shopee, and Bukalapak has enabled local MSME products from Sumbawa including Sumbawa honey, wild horse milk, and woven crafts to reach markets beyond the geographical boundaries of the regency, even penetrating inter-island and small-scale export markets. This finding is in line with Susanto & Sucahyo (2023), who found that the comprehensive utilization of the digital ecosystem is positively correlated with an increase in MSME turnover and profitability in Indonesia.

Besides market expansion, the digital economy also contributes to operational cost efficiency. The use of social media as a promotional tool with costs significantly lower than conventional advertising, as well as the use of digital financial applications for cash

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

management and bookkeeping, are proven to help MSMEs minimize operational expenses. This is supported by the findings of Bakry & Puspita (2022), which showed that operational digitalization is negatively correlated with MSME overhead costs, thus leading to a net increase in profit margins.

On the other hand, the coefficient value of 0.427 also indicates that although the effect is significant, there are still other factors contributing to MSME revenue that need to be further investigated in future research, such as access to financing, production capacity, and regional macroeconomic factors.

The Effect of Digital Literacy on MSME Revenue

The results of H2 testing confirm that Digital Literacy has a positive and significant effect on MSME Revenue ($\beta = 0.318$; $p < 0.001$). This finding is consistent with the research of Febriyanti et al. (2023), Muhamamad Ridhwan Nur Rachman & Prasetyo (2023), and Wahyuni et al. (2022), which found that the digital capability of MSME actors is directly and positively correlated with their business performance.

The direct effect of digital literacy on revenue can be understood from two main dimensions. The first dimension is technical capability, namely the capacity of MSME actors to operate digital devices, manage business accounts on digital platforms, and utilize available analytical features. MSME actors with higher technical literacy tend to be better able to optimize online store settings, respond to customer inquiries more swiftly, and leverage digital sales data for business decision-making. The second dimension is digital content and communication capability, which is the capacity to create engaging and effective marketing content on social media. This capability largely determines the effectiveness of digital marketing strategies that directly impact sales volume (Dwityas & Briandana, 2017; Chaffey & Ellis-Chadwick, 2019).

In the context of Sumbawa Regency, the substantial effect of digital literacy ($\beta = 0.318$) reflects the reality that an individual's ability to operate digital technology is a fundamental prerequisite that determines how far MSME actors can seize the opportunities offered by the digital ecosystem. This finding also affirms that digital literacy improvement programs whether initiated by the local government, universities, or the private sector have measurable and direct economic impacts for MSME actors. In other words, investing in human digital capacity enhancement is equivalent to investing in the overall productivity and competitiveness of MSMEs (Prasetyo & Kistanti, 2020).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

The Moderating Role of Digital Literacy on the Relationship Between the Digital Economy and MSME Revenue

The most crucial finding in this study is the proven moderating role of Digital Literacy in strengthening the relationship between the Digital Economy and MSME Revenue (β = 0.241; T = 2.896; p = 0.004). This result supports H3 while simultaneously answering the primary research question regarding the conditionality of the digital economy's impact on MSME revenue. Conceptually, this finding can be interpreted as follows: the positive impact of utilizing the digital economy on MSME revenue will be stronger when MSME actors possess a higher level of digital literacy.

Within the framework of the Technology Acceptance Model (TAM) developed by Davis (1989), perceived ease of use and perceived usefulness are the two main factors determining the intention to use technology. Digital literacy serves as an antecedent factor that enhances the perceived ease of use for various digital platforms. Thus, more digitally literate MSME actors tend to have a more positive perception of digital technology, use it more frequently and skillfully, and ultimately derive greater economic benefits from it.

This moderation finding can also be understood through the concept of the digital divide (Çilan et al., 2009; Puspitasari & Ishii, 2016). In Sumbawa Regency, there is a prominent gap between MSMEs with high digital literacy and those with low digital literacy. MSMEs with high digital literacy are not only capable of using digital platforms more effectively but are also more agile in responding to digital trend shifts, utilizing new features on platforms, and managing digital transaction risks. Conversely, MSMEs with low digital literacy tend to utilize digital technology only at the most basic level for instance, merely having a social media account without a planned content strategy so the benefits obtained from the digital economy remain limited (Indrawati et al., 2021; Maulana & Kurniawan, 2022).

Practically, this finding has critical policy implications. Investment in digital infrastructure alone is insufficient to ensure that MSMEs can reap the maximum benefits from the digital economy. The Government of Sumbawa Regency, along with universities and relevant stakeholders, needs to comprehensively integrate digital literacy enhancement programs into the MSME empowerment agenda. Programs such as digital marketing training, online store management, digital transaction security, and basic data analytics utilization must be prioritized so that all strata of MSME actors can optimize the increasingly growing digital economy ecosystem (Agustina & Rahayu, 2022; Ambarini et al., 2023).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Compared to similar studies, this research strengthens the argument put forward by Oktavia & Wulandari (2022) on Lombok Island, who also found a moderating effect of digital literacy in the relationship between digital adoption and MSME performance. However, this study provides additional contributions by employing a more comprehensive PLS-SEM model, a larger and more sectorally diversified sample, and the specific context of Sumbawa Regency which has not been extensively researched before. Hence, these findings enrich the repertoire of literature on the digital transformation of MSMEs in eastern Indonesia.

CONCLUSION

This study aims to examine the effect of the digital economy on MSME revenue in Sumbawa Regency with digital literacy as a moderating variable, using the PLS-SEM method assisted by SmartPLS 4. Based on the results of the analysis of 100 MSME actors actively utilizing the internet in their business activities, three main findings can be concluded as follows.

First, the Digital Economy is proven to have a positive and significant effect on MSME Revenue. This implies that the more active and intensive MSME actors are in utilizing the digital ecosystem, ranging from e-commerce and business social media to digital payment systems, the greater the increase in revenue they achieve.

Second, Digital Literacy has a positive and significant effect on MSME Revenue, indicating that the digital capabilities of MSME actors independently contribute to an increase in business revenue.

Third, Digital Literacy is proven to positively moderate the relationship between the Digital Economy and MSME Revenue. This means that MSME actors with a higher level of digital literacy will derive greater economic benefits from utilizing the digital ecosystem.

Theoretically, this study contributes to integrating the Diffusion of Innovations Theory, the Technology Acceptance Model, and the digital divide concept in explaining the dynamics of MSME digital transformation in developing regions. Practically, the results of this study assert that MSME digitalization programs must be simultaneously accompanied by digital literacy improvement programs to produce optimal and sustainable revenue impacts.

REFERENCES

Abou-Shouk, M. A., & Khalifa, G. S. A. (2017). The influence of website quality dimensions on e-purchasing behaviour and e-loyalty: A comparative study of

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Egyptian travel agents and hotels. *Journal of Travel & Tourism Marketing*, 34(5), 608–623. https://doi.org/10.1080/10548408.2016.1209151

Agustina, R., & Rahayu, M. (2022). Pengaruh e-commerce terhadap pendapatan UMKM di Indonesia: Peran literasi digital sebagai pemoderasi. *Jurnal Manajemen dan Kewirausahaan*, 24(1), 45–58. https://doi.org/10.9744/jmk.24.1.45-58

Akter, S., & Wamba, S. F. (2016). Big data analytics in e-commerce: A systematic review and agenda for future research. *Electronic Markets*, 26(2), 173–194. https://doi.org/10.1007/s12525-016-0219-0

Ambarini, A., Supriyanto, A., & Lestari, P. (2023). Transformasi digital UMKM dan peningkatan daya saing: Tinjauan empiris di Jawa Tengah. *Jurnal Ekonomi dan Bisnis*, 26(2), 101–119. https://doi.org/10.24914/jeb.v26i2.7821

Annisa, R., Suryanto, T., & Hidayat, R. (2023). Pengaruh karakteristik wirausaha dan inovasi terhadap kinerja pemasaran UMKM kerajinan di NTB. *Jurnal Bisnis dan Kewirausahaan*, 19(1), 45–58.

Arianto, B. (2020). Pengembangan UMKM digital di masa pandemi COVID-19. *ATRABIS: Jurnal Administrasi Bisnis*, 6(2), 232–247. https://doi.org/10.38204/atrabis.v6i2.512

Badan Pusat Statistik. (2023). *Profil usaha mikro kecil Indonesia 2022*. BPS RI.

Badan Pusat Statistik Kabupaten Sumbawa. (2023). *Sumbawa Dalam Angka 2023*. BPS Kabupaten Sumbawa.

Bakry, M. H., & Puspita, D. (2022). Dampak adopsi teknologi digital terhadap kinerja keuangan UMKM sektor perdagangan. *Jurnal Keuangan dan Perbankan*, 26(3), 389–404. https://doi.org/10.26905/jkdp.v26i3.7741

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Chaffey, D., & Ellis-Chadwick, F. (2019). *Digital marketing: Strategy, implementation and practice* (7th ed.). Pearson Education.

Çilan, Ç., Bolat, B. A., & Coskun, E. (2009). Analysing digital divide within and between member and candidate countries of European Union. *Government Information Quarterly*, 26(1), 98–105. https://doi.org/10.1016/j.giq.2007.11.002

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Clauss, T., Bouncken, R. B., Laudien, S., & Kraus, S. (2022). Business model reconfiguration and innovation in SMEs: A mixed-methods analysis. *Journal of Business Research*, 142, 182–195. https://doi.org/10.1016/j.jbusres.2021.12.053

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. https://doi.org/10.2307/249008

Deku, W. A., Wang, R., & Darko, D. A. (2024). Digital marketing, technological orientation and SME performance in emerging economies. *Journal of Small Business and Enterprise Development*, 31(2), 312–335. https://doi.org/10.1108/JSBED-03-2023-0095

Dwityas, N. A., & Briandana, R. (2017). Social media in travel decision making process. *International Journal of Humanities and Social Science*, 7(7), 193–201.

Febriyanti, E., Sunarto, S., & Wijayanto, A. (2023). Pengaruh marketplace terhadap omzet penjualan UMKM dengan literasi digital sebagai variabel moderasi. *Jurnal Bisnis dan Manajemen*, 23(1), 77–93. https://doi.org/10.23960/jbm.v23i1.201

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. https://doi.org/10.1177/002224378101800104

Ghozali, I. (2021). *Structural equation modeling: Metode alternatif dengan partial least square (PLS)* (5th ed.). Badan Penerbit Universitas Diponegoro.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hair, J. F., Sarstedt, M., & Ringle, C. M. (2022). Explaining and predicting constructs, indicators, and outcomes: Necessary or surplus? *European Journal of Marketing*, 56(6), 1820–1845. https://doi.org/10.1108/EJM-06-2021-0464

Haryanti, T., & Subriadi, A. P. (2020). E-commerce factors influencing small and medium enterprises (SMEs) in Indonesia. *AIP Conference Proceedings*, 2217(1), 030152. https://doi.org/10.1063/5.0000834

Hasna, A. (2021). Pengaruh inovasi produk, proses, dan jasa terhadap kinerja UMKM di Indonesia. *Jurnal Ekonomi dan Bisnis Indonesia*, 36(2), 145–160.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Indrawati, I., Muthalib, A. A., & Budi, T. R. (2021). Transformasi digital dan pertumbuhan UMKM: Studi kasus di kawasan timur Indonesia. *Jurnal Ekonomi Regional Unimal*, 4(2), 1–14. https://doi.org/10.29103/eru.v4i2.4218

Kementerian Komunikasi dan Informatika. (2022). *Indeks literasi digital Indonesia 2022*. Kominfo RI.

Kementerian Koperasi dan UKM. (2023). *Laporan kinerja Kementerian Koperasi dan UKM tahun 2022*. Kemenkop UKM RI.

Khan, M. R., Rahman, M. M., & Hossain, M. A. (2022). Entrepreneurial competencies and MSME performance: Evidence from Bangladesh. *Journal of Small Business Management*, 60(4), 789–812.

Kohler, T., & Chesbrough, H. (2019). From collaborative community to competitive market: The quest to develop a framework for shifting between open and closed innovation. *California Management Review*, 61(2), 20–35. https://doi.org/10.1177/0008125618825989

Mahadevan, B. (2000). Business models for Internet-based e-commerce: An anatomy. *California Management Review*, 42(4), 55–69. https://doi.org/10.2307/41166053

Maulana, A., & Kurniawan, D. (2022). Peran teknologi informasi dan komunikasi terhadap kinerja UMKM di Nusa Tenggara Barat. *Jurnal Manajemen Bisnis dan Organisasi*, 6(3), 183–197. https://doi.org/10.33369/jmbo.v6i3.2214

McClelland, D. C. (1961). *The achieving society*. Van Nostrand.

Muhamamad Ridhwan Nur Rachman, & Prasetyo, B. (2023). Pengaruh penggunaan media sosial dan marketplace terhadap pendapatan pengusaha UMKM dengan literasi digital sebagai variabel moderasi. *Jurnal Ilmiah Manajemen, Ekonomi, dan Akuntansi*, 7(2), 553–568.

Mutakin, A., & Fahmi, I. (2021). Digital economy and SMEs performance: Evidence from Indonesia. *International Journal of Economics and Business Administration*, 9(1), 3–14. https://doi.org/10.35808/ijeba/645

Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, P. M. (2021). *Human resource management: Gaining a competitive advantage* (12th ed.). McGraw-Hill Education.

OECD. (2019). *OECD SME and entrepreneurship outlook 2019*. OECD Publishing. https://doi.org/10.1787/34907e9c-en

Oktavia, D., & Wulandari, T. (2022). Pengaruh adopsi e-commerce terhadap pendapatan UMKM dengan moderasi kemampuan digital: Studi empiris pada pelaku usaha di

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Pulau Lombok. *Jurnal Akuntansi dan Keuangan Indonesia*, 19(2), 125–141. https://doi.org/10.21002/jaki.2022.08

Prasetyo, P. E., & Kistanti, N. R. (2020). Human capital, institutional economics and entrepreneurship as a driver for quality and sustainable economic growth. *Entrepreneurship and Sustainability Issues*, 7(4), 2575–2589. https://doi.org/10.9770/jesi.2020.7.4(1)

Puspitasari, L., & Ishii, K. (2016). Digital divides and mobile Internet in Indonesia: Impact of smartphones. *Telematics and Informatics*, 33(2), 472–483. https://doi.org/10.1016/j.tele.2015.11.001

Qalati, S. A., Ostic, D., Fan, M., & Li, S. (2022). Social media usage and SME performance: The mediating role of digital marketing and moderating role of entrepreneurial orientation. *Journal of Business Research*, 150, 132–145.

Rafiq, M., Syahruddin, H., & Hamid, N. (2024). Pengaruh karakteristik kewirausahaan terhadap pengembangan UMKM di Kabupaten Sumbawa. *Jurnal Manajemen dan Bisnis Indonesia*, 12(1), 67–82.

Rahayu, R., & Day, J. (2015). Determinant factors of e-commerce adoption by SMEs in developing country: Evidence from Indonesia. *Procedia - Social and Behavioral Sciences*, 195, 142–150. https://doi.org/10.1016/j.sbspro.2015.06.423

Ringle, C. M., Wende, S., & Becker, J.-M. (2022). *SmartPLS 4*. SmartPLS. https://www.smartpls.com

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Sarstedt, M., Hair, J. F., Ringle, C. M., Thiele, K. O., & Gudergan, S. P. (2016). Estimation issues with PLS and CBSEM: Where the bias lies! *Journal of Business Research*, 69(10), 3998–4010. https://doi.org/10.1016/j.jbusres.2016.06.007

Schumpeter, J. A. (1934). *The theory of economic development*. Harvard University Press.

Susanto, H., & Sucahyo, Y. G. (2023). Pemanfaatan platform digital dan kinerja usaha UMKM di Indonesia: Perspektif ekosistem digital. *Jurnal Sistem Informasi Bisnis*, 13(1), 1–14. https://doi.org/10.21456/vol13iss1pp1-14

Tambunan, T. (2019). Recent evidence of the development of micro, small and medium enterprises in Indonesia. *Journal of Global Entrepreneurship Research*, 9(18). https://doi.org/10.1186/s40497-018-0140-4

Tapscott, D. (1995). *The digital economy: Promise and peril in the age of networked intelligence*. McGraw-Hill.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Teece, D. J. (2021). Dynamic capabilities and strategic management: Organizing for innovation and growth. *Strategic Management Journal*, 42(5), 952–975.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Toni, M., Renaldi, R., & Hidayat, R. (2024). Digital marketing adoption and MSME performance: A systematic literature review. *Journal of Digital Innovation*, 5(1), 23–41.

Udayana, I. B. N. (2024). E-commerce, digital marketing, and MSME performance in Indonesia. *Indonesian Journal of Business and Economics*, 7(1), 89–104.

Wahyuni, S., Lestari, E., & Pradana, M. (2022). Literasi digital dan kinerja UMKM: Studi pada pelaku usaha kuliner di Kabupaten Sumbawa Besar. *Jurnal Manajemen Terapan dan Keuangan*, 11(3), 598–614. https://doi.org/10.22437/jmk.v11i3.17802

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180. https://doi.org/10.1002/smj.4250050207

Wu, C. W., Chen, W. H., & Lin, Y. S. (2024). Digital marketing strategy, bricolage, and firm performance: Evidence from Mexican SMEs. *Journal of Business Research*, 172, 114–132.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.