

The Influence of Technological Disruption on HR development strategies moderated by The Digital Readiness of HR in Women's MSMEs

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ABSTRACT

This study aimed to analyze the effect of technological disruption on human resource development strategies, which was moderated by the digital readiness of human resources in women-owned MSMEs. The study employed a quantitative approach with an explanatory research design. The data used in this study were cross-sectional, where data collection was conducted at a single point in time to capture the conditions of women-owned MSMEs at the time the research was carried out. The results showed that the Internal Strategy had a positive and highly significant effect on External Factors; External Factors had a positive and highly significant effect on Women's Readiness; however, the direct effect of Internal Strategy on Women's Readiness was not significant and even tended to be negative. This indicated that the impact of Internal Strategy on Women's Readiness did not occur directly but entirely occurred through the mediating role of External Factors.

INTRODUCTION

The role of Micro, Small, and Medium Enterprises (MSMEs) as the backbone of the national economy is undeniable, contributing significantly to GDP and employment (Tambunan, 2019). Among the millions of MSMEs, women play a central role as the driving force of the family and community economy (Widiawati et al., 2022). However, the era of digitalization and the Industrial Revolution 4.0 brings fundamental disruptive challenges, changing the competitive landscape, consumer behavior, and business operational models (Hendrawan et al., 2024). This disruption is a double-edged sword: on the one hand, it opens up broader market opportunities through e-commerce and digital marketing, but on the other, it threatens the existence of businesses that fail to adapt (Kurniawati et al., 2021).

For women-owned MSMEs, these challenges are often more severe due to the digital divide, both in terms of access, skills, and confidence in using technology (Sari & Purnomo, 2021). Changing consumer preferences toward online platforms, the emergence of technology-based competitors, and the need to manage operations digitally are creating massive external pressures. These pressures demand a strategic response from within MSMEs, particularly in terms of developing their own human resource (HR) capacity. Efforts such as participating in training, receiving mentoring, and creating a culture of learning are crucial for survival and competition amidst digital turbulence (Fahriyah et al., 2021).

Empirically, MSMEs are the most dominant business entity in Indonesia. Data from the Ministry of Cooperatives and SMEs (2024) shows that the number of MSMEs has reached more than 66 million units, equivalent to 99.9% of the total national business units. Their contribution to the economy is vital, contributing 60.5% to Gross Domestic Product (GDP) and absorbing up to 97% of the total national workforce. These figures emphasize that MSMEs are not merely complementary but also serve as the primary foundation of economic stability.

Among these millions of MSMEs, women play a central role. Reports from various institutions consistently show that the majority of MSMEs are women, with an estimated 64.5% of all MSMEs (equivalent to 37 million businesses) owned and managed by women (Ministry of Women's Empowerment and Child Protection, 2023). However, the majority of these businesses are concentrated at the micro-scale, where challenges related to access to capital, technology, and markets are even more significant.

The digital era and the Industrial Revolution 4.0 bring fundamental disruptive challenges, changing the competitive landscape and consumer behavior (Hendrawan et al., 2024). This disruption is a double-edged sword: opening broader market opportunities, but also threatening the existence of businesses that fail to adapt (Kurniawati et al., 2021). This threat becomes even more apparent when considering the existing digital divide data. Of the 66 million MSMEs, only around 17.5 million have integrated into the digital ecosystem (Coordinating Ministry for Economic Affairs, 2022). This means that more than 70% of MSMEs remain vulnerable to being eroded by changing times.

Table 1. Digital Gap of MSMEs in Indonesia (Estimated Data 2022-2023)

Category	Quantity (in Million Units)	Persentase
Total number of MSMEs in Indonesia	66,0	100%
Digitally Integrated MSMEs	17,5	26,5%
MSMEs Not Yet Digitalized	48,5	73,5%

Source: Processed from data from the Coordinating Ministry for Economic Affairs (2022)

Table 1 above shows the wide gap between the total number of MSMEs and those that have successfully integrated into the digital ecosystem, indicating the significant challenges they face. For women-owned MSMEs, these challenges are often more severe due to the multi-layered digital divide, ranging from access and skills to self-confidence (Sari & Purnomo, 2021). The phenomenon of "pseudo-digitalization"—where MSMEs simply have social media accounts without a clear strategy—is also widespread, indicating that technology adoption is not necessarily effective. Changing consumer preferences, intense competition, and the need to manage operations digitally create massive external pressures that demand strategic responses from MSMEs, particularly in human resource capacity development. Efforts such as training, mentoring, and creating a learning culture are crucial for survival (Fahriyah et al., 2021). This empirical context highlights the urgency and complexity of the problem, providing the basis for reviewing current research and identifying existing gaps.

Current research (state of the art) on MSME digitalization in Indonesia has explored various important aspects. A large number of studies have focused on identifying barriers and drivers of technology adoption. Commonly identified barriers include limited capital, low digital literacy, lack of infrastructure, and resistance to change (Nashir et al., 2025; Hendrawan et al., 2024). Drivers, on the other hand, include perceived benefits, competitive pressures, and government support (Sitompul et al., 2024). Other studies examine the impact of digital adoption on business performance, consistently showing a positive correlation between the use of e-commerce and social media and increased sales and market reach (Panjaitan et al., 2024; Rafidah, 2024).

However, amidst this wealth of literature, significant research gaps remain. First, existing research tends to treat human resource development as an antecedent or prerequisite for technology adoption, rather than as a dynamic strategic response to external pressures. Many studies conclude that "human resources need to be improved," without analyzing how disruptive pressures themselves act as triggers that force MSMEs to consciously formulate strategies for developing their internal capabilities. The causal relationship between perceived disruption threats (X1) and HR development strategy formulation (Y) remains underexplored.

Second, existing research models are often linear and fail to adequately explain the heterogeneity of responses among MSMEs. Why do two MSMEs facing the same disruption pressure exhibit different strategic responses? Internal psychological factors and individual capabilities are often not integrated

into models. Variables such as self-confidence, learning proactivity, and innovative mindset – which we summarize as "digital readiness" – have not been widely tested as determinants that strengthen or weaken the relationship between external pressures and internal responses.

Addressing this gap, the novelty of this research lies in the development of a holistic moderation model. This research not only tests the direct relationship between technological disruption and human resource development strategies but also specifically proposes "digital readiness" as a moderating variable. We argue that digital readiness is not simply technical capability, but rather a construct encompassing self-efficacy, self-directed learning orientation, and innovative capabilities. This variable serves as a "catalyst" that determines the extent to which external pressures can be translated into effective self-development actions.

Thus, the main contribution of this research is to provide a more nuanced understanding of the adaptation mechanisms of women's MSMEs. Rather than simply identifying problems, this research explains why and under what conditions women's MSMEs successfully respond to disruption. These findings will enrich the strategic management literature in the context of MSMEs and provide sharper practical implications for designing empowerment programs. Therefore, this study asks fundamental questions:

1. Does the external factor of technological disruption influence the internal human resource development strategy of women-owned MSMEs?
2. Does the digital readiness of women's human resources moderate (strengthen) the influence of the external factor of technological disruption on the internal human resource development strategy?

Based on the background and research gaps outlined, understanding of the strategic response mechanisms of women-owned MSMEs in the face of technological disruption remains limited. Existing studies have not fully explained how external pressures drive the formulation of human resource development strategies and why the effectiveness of these responses varies. Therefore, the research questions are formulated as follows:

1. How significant is the influence of the external factor of technological disruption on the internal human resource development strategy of women-owned MSMEs?
2. What is the role of the digital readiness of women's human resources as a moderating variable in strengthening or weakening the relationship between technological disruption and human resource development strategy?
3. What strategic model can be formulated from the interaction between technological disruption, digital readiness, and human resource development strategies to increase the competitiveness of women-owned MSMEs?

In line with the problem formulation above, the objectives of this research are:

1. To analyze and empirically demonstrate the influence of external factors of technological disruption on internal human resource development strategies in women-owned MSMEs.
2. To test and analyze the moderating role of women's digital readiness in the relationship between technological disruption and human resource development strategies. Formulating a strategic model that can serve as a guide for women MSMEs, the government, and other stakeholders in designing effective capacity building programs in the digital era

THEORETICAL REVIEW

Technological Disruption and Adaptation Pressures in MSMEs

Digital transformation is defined as the adoption of technology to improve operational efficiency, expand market reach, and enhance competitiveness (Hendrawan et al., 2024; Siregar & Sudarmanto, 2023). For MSMEs, this transformation is no longer an option but a necessity for survival in the Industrial Revolution 4.0 era (Kurniawati et al., 2021). This phenomenon creates significant external pressures, which can be identified through three main dimensions:

1. **Changing Consumer Behavior:** Modern consumers are increasingly turning to digital platforms to seek information, conduct transactions, and provide reviews. MSMEs that lack a strong digital presence risk losing relevance and market access (Nashir et al., 2025). Marketing through social media and e-commerce sales have become the new norm, putting pressure on MSMEs to adapt (Panjaitan et al., 2024).
2. **New Competitive Landscape:** Digitalization has given rise to new business models and enabled competitors – both large and small – to enter the market more easily. Competitors that effectively adopt technology can offer more competitive prices, faster service, and a better customer experience (Singh et al., 2008). This pressure is forcing traditional MSMEs to reevaluate their value propositions and operational efficiency.
3. **Demands for Operational Efficiency:** Disruption is occurring not only in the marketplace but also internally. The need to manage inventory in real time, maintain digital financial records, and manage customer relationships efficiently is becoming the new standard. MSMEs that still rely on manual processes face the risk of inefficiency, high operational costs, and difficulties in data-driven decision-making (Siregar & Sudarmanto, 2023). Technological disruption thus functions as an "external shock" that creates an urgency for MSMEs to make fundamental changes. This pressure forces business actors to recognize the capability gap between their internal conditions and the demands of the external environment.

Human Resource Development Strategy as an Internal Response

Facing external pressures, MSMEs must formulate a strategic response from within. One of the most crucial responses is through a Human Resource (HR) development strategy. In this context, HR development is not merely viewed as a casual training program, but rather as a planned, adaptive strategy

to build the capabilities needed for survival and growth (Surya et al., 2021). This strategy includes several key components:

1. **Digital Upskilling:** This is the most direct response to disruption. This strategy includes structured efforts to improve practical technological skills, such as digital marketing, social media management, e-commerce platform utilization, and the use of digital financial applications (Nursini, 2020).
2. **Managerial and Entrepreneurial Capacity Development:** Disruption demands more than just technical skills. MSMEs need to develop the ability to think strategically, analyze market data, identify innovation opportunities, and manage change within their businesses.
3. **Creating a Learning and Adaptive Culture:** A sustainable human resource development strategy aims to instill a growth mindset and a learning culture within the organization. This enables MSMEs to not only respond to current disruptions but also to proactively adapt to future changes. For women-owned MSMEs, formulating this strategy is particularly crucial, given that they often face dual barriers, both business- and socio-cultural-related (Tambunan, 2019; Sari & Purnomo, 2021)

Digital Readiness as an Individual Capability

MSMEs' responses to disruptive pressures are not uniform. The effectiveness of formulated human resource development strategies is heavily influenced by individuals' internal capabilities. In this research, we conceptualize this capability as "digital readiness," a multidimensional construct that goes beyond mere technical literacy. Based on a synthesis of psychology, education, and management literature, we define digital readiness through three components:

1. **Digital Self-Efficacy:** Refers to an individual's belief in their ability to successfully use digital technology to achieve business goals. MSMEs with high self-efficacy tend to be more persistent in overcoming difficulties, more open to experimentation, and quicker in learning new tools.
2. **Self-Directed Learning Orientation:** This is an individual's proactive drive to identify learning needs, independently seek information sources, and apply new knowledge without always relying on formal training programs. Amidst rapid technological change, this capability is crucial.
3. **Innovative Capability:** The ability to not only use technology but also to adapt and leverage it creatively to create new value. This could include developing new business models, product innovation based on digital feedback, or using data for service personalization (Adisaksana, 2022). Digital readiness, therefore, serves as a lens for perception and a catalyst for action. Individuals with high digital readiness will view disruption as an opportunity, while those with low readiness tend to view it as a crippling threat.

Developing a Hypothesis on the Effect of Technological Disruption on HR Development Strategies

External pressures created by technological disruption force MSMEs to recognize the mismatch between their capabilities and market demands. Awareness of this "competency gap" becomes a key driver for them to consciously and deliberately formulate strategies to increase HR capacity. When MSMEs perceive competitors gaining an edge due to technology or when customers begin to shift to online platforms, they are compelled to seek solutions through skill enhancement. In other words, disruptive pressures become a trigger that shifts the need for human resource development from a "nice-to-have" to a "must-have" for survival. Previous research has shown how crises, such as the COVID-19 pandemic, accelerate digital transformation and push MSMEs to adapt (Priyono et al., 2020). Based on this argument, we propose our first hypothesis:

H1: Technological disruption has a positive and significant impact on human resource development strategies in women-owned MSMEs.

The Moderating Role of Digital Readiness: The relationship between disruptive pressures and human resource development strategies is not mechanical. The effectiveness of these strategic responses likely depends on the internal capabilities of MSMEs themselves. This is where digital readiness plays a central role.

For women-owned MSMEs with a high level of digital readiness, disruptive pressures will be perceived as a signal to act. Strong self-efficacy makes them unafraid to experiment with new technologies; a self-learning orientation encourages them to proactively seek solutions; and innovative capabilities enable them to see opportunities behind challenges. As a result, external pressures will effectively translate into targeted and concrete human resource development strategies. The relationship between disruption and HR development strategies will be strengthened.

Conversely, for those with low levels of digital readiness, the same pressures can create feelings of threat, anxiety, and resistance to change. Without self-confidence and a drive to learn, external pressures may simply lead to strategic paralysis or unplanned, reactive actions. Thus, the relationship between disruption and HR development strategies will be weakened. Therefore, we propose a second hypothesis:

H2: Women's digital readiness positively moderates the effect of technological disruption on HR development strategies.

METHODOLOGY

Research Design

This study uses a quantitative approach with an explanatory research design. The quantitative approach was chosen because this study aims to measure the influence between variables and test hypotheses statistically. The explanatory design is used to explain the causal relationship between the independent variable (Technological Disruption), the dependent variable (Human Resource Development Strategy), and the moderating variable (Digital

Readiness). The data used in this study is cross-sectional, where data collection was conducted at a specific point in time to obtain a snapshot of the condition of women-owned MSMEs at the time of the study.

Research Population and Sample

The population in this study is all Micro, Small, and Medium Enterprises (MSMEs) owned and/or managed by women in Tarumajaya Village, Kertasari District, Bandung, West Java, Indonesia. The target population meets the following criteria:

- a. The business is owned and actively managed by a woman.
- b. It has been operating for at least 2 (two) years, to ensure that the business owner has experienced the impact of technological disruption.
- c. Operate in sectors heavily impacted by digitalization, such as culinary, fashion, or crafts.

Sampling Technique

The sampling technique used was non-probability sampling with a purposive sampling method. This method was chosen because not all members of the population met the relevant criteria for the study, and a complete and accurate sampling frame for all women-owned MSMEs in the study location was unavailable. The sample was selected based on certain considerations consistent with the research objectives, namely:

- a. Respondents are owners or primary managers responsible for strategic decision-making.
- b. Respondents' businesses have utilized at least one form of digital technology in their operations (for example, social media for marketing, messaging apps for customer service, or e-commerce platforms).

Sample Size

In Structural Equation Modeling (SEM) analysis using the Partial Least Squares (PLS) approach, sample size determination can refer to several guidelines. One commonly used rule is the "10 times rule," which is 10 times the number of formative indicators or 10 times the number of structural paths leading to a single latent variable. However, for more stable and robust results, Hair et al. (2017) recommends a minimum sample size of between 100 and 150 respondents. Therefore, this study aims to collect data from 100 to 150 respondents who meet the criteria. This number is considered adequate for analysis using SEM-PLS and provides sufficient statistical power for hypothesis testing, including moderating effects.

The data used in this study are primary data collected directly from respondents through questionnaires. The questionnaire will be structured as closed-ended questions using a 5-point Likert scale, with the following ranges:

- 1 = Strongly Disagree (SD)
- 2 = Disagree (D)
- 3 = Neutral (N)
- 4 = Agree (A)
- 5 = Strongly Agree (SA)

The questionnaire will be distributed online through platforms such as Google Forms to reach respondents efficiently. Distribution will be conducted through MSME community networks, women's entrepreneur associations, and relevant government agencies.

Operational Definition of Variables

Technological Disruption (X1) - Independent Variable

Conceptual Definition: MSME actors' perceptions of the pressures of external change caused by digital technology developments, which force them to adapt.

Indicators:

X1.1: Perception of changing consumer behavior shifting to online platforms.

X1.2: Perception of increasing competition from more digitally savvy businesses.

X1.3: Perception of the demand to manage business operations digitally (e.g., finance, marketing) for greater efficiency.

Human Resource Development Strategy (Y) - Dependent Variable

Conceptual Definition: Conscious and planned efforts undertaken by MSMEs to improve their knowledge, skills, and capabilities in response to the demands of the digital era.

Indicators:

Y1.1: Active efforts to participate in training or webinars related to digital skills.

Y1.2: Initiatives for self-learning (e.g., through online tutorials) to overcome technical challenges.

Y1.3: Deliberate allocation of time and/or resources (funds) for developing digital competencies.

Digital Readiness (M) - Moderating Variable

Conceptual Definition: An individual's internal capabilities, including self-confidence, proactive learning, and innovative ability to use technology.

Indicators:

M1.1: High self-confidence in learning and using new technology or applications for business (Self-Efficacy).

M1.2: Proactivity in seeking new information and knowledge about technology without having to wait for instructions (Learning Orientation).

M1.3: Courage to try or experiment with new ways of using technology to improve business (Innovative Capability).

Data Analysis Technique:

SEM-PLS with SmartPLS 3. The collected data will be analyzed using the Structural Equation Modeling (SEM) method with the Partial Least Squares (PLS) approach. The reasons for choosing SEM-PLS are:

1. Data Flexibility: PLS does not require the assumption of normally distributed data, which is often difficult to meet in social science research.

2. Predictive Purpose: It is suitable for research that aims to test theories and explain predictive relationships between variables, including complex models with moderating effects.
3. Sample Size: Reliable for relatively small sample sizes (compared to CB-SEM).

The software used is SmartPLS 3. Data analysis will be conducted in two main stages according to the procedures recommended by Hair et al. (2017):

Stage 1: Evaluation of the Measurement Model (Outer Model). This stage aims to test the validity and reliability of the indicators measuring each variable.

- a. Convergent Validity: Measures the extent to which indicators of a construct are truly positively correlated. Evaluated through:
Outer Loadings > 0.70 .
Average Variance Extracted (AVE) > 0.50 .
- b. Discriminant Validity: Ensures that a construct is empirically distinct from other constructs in the model. Evaluated through:
Fornell-Larcker Criterion: The square root of the AVE of each construct must be higher than the correlation value with other constructs.
Heterotrait-Monotrait Ratio (HTMT): The HTMT value between constructs must be less than 0.90.
- c. Construct Reliability: Measures the internal consistency of the indicators. Evaluated through:
Cronbach's Alpha value > 0.70 .
Composite Reliability value > 0.70 .

Stage 2: Structural Model Evaluation (Inner Model) This stage aims to test the relationship between constructs and research hypotheses.

- a. Coefficient of Determination (R^2): Measures how much of the variance in the dependent variable can be explained by the independent variables. Values of 0.75, 0.50, and 0.25 can be interpreted as substantial, moderate, and weak, respectively.
- b. Hypothesis Testing (Path Coefficient): Conducted using the Bootstrapping (resampling) procedure in SmartPLS 3 to obtain t-statistics and p-values.
H1 (Direct Effect): The hypothesis is accepted if the p-value is < 0.05 (at a 5% significance level), with a positive path coefficient.
H2 (Moderation Effect): To test the moderation effect, an interaction term will be created between the variables Technological Disruption (X_1) and Digital Readiness (M). The moderation hypothesis is accepted if the path coefficient from the interaction term ($X_1 * M$) to the dependent variable (Y) is statistically significant (p-value < 0.05).

RESULTS

Respondent Characteristics and Descriptive Statistics

This study successfully collected data from 130 female MSME respondents who met the criteria. Based on the descriptive statistical analysis of the latent variable scores, the following general description was obtained:

Table 2: Descriptive Statistics of Respondents

Measurement Model Evaluation (Outer Model)

The outer model evaluation was conducted to ensure that the research instrument (questionnaire) was valid and reliable.

1. Convergent Validity

Convergent validity indicates that the indicators of a construct accurately measure the construct. The criteria used were Outer Loadings > 0.70 and Average Variance Extracted (AVE) > 0.50.

Table 2. Results of Convergent Validity and Reliability Tests

Construk	Indicator	Outer Loadings	AVE	Composite Reliability (CR)	Cronbach's Alpha (CA)	Result
Internal Strategic	X11	0.81	0.676	0.912	0.879	Valid & Reliabel
	X12	0.841				
	X13	0.84				
	X14	0.755				
	X15	0.861				
Eksternal Factor	X21	0.7	0.601	0.857	0.778	Valid & Reliabel
	X22	0.779				
	X24	0.829				
	X25	0.787				
Kesiapan Perempuan	Y11	0.817	0.689	0.917	0.886	Valid & Reliabel
	Y12	0.883				
	Y13	0.885				
	Y14	0.816				
	Y15	0.74				

The results in Table 2 show:

- a. All Outer Loadings values are above 0.70, indicating that each indicator adequately reflects its construct.
- b. All AVE values are above the 0.50 threshold, confirming that the variance captured by the construct is greater than the variance due to measurement error.

Thus, convergent validity for all constructs has been met.

1. Internal Reliability (Internal Consistency Reliability)

Reliability was measured using Composite Reliability (CR) and Cronbach's Alpha (CA) with a criterion of >0.70.

- a. CR values for all constructs (0.912, 0.857, 0.917) were well above 0.70.
- b. CA values for all constructs (0.879, 0.778, 0.886) were also above 0.70.

In conclusion, all constructs have excellent reliability.

2. Discriminant Validity

Discriminant validity ensures that each construct is empirically distinct from the others. The method used is the Fornell-Larcker criterion.

Table 3. Results of the Discriminant Validity Test (Fornell-Larcker)

	Exsternal Factor	Women's Readiness	Internal Strategic
Eksternal factor	0.775		
Women's Readiness	0.702	0.83	
Internal Strategic	0.639	0.628	0.822

The bold diagonal numbers are the square roots of the AVE.

According to Table 3, the square root of the AVE for each construct (diagonal numbers) is higher than its correlation value with other constructs in the same column and row. This indicates that discriminant validity is met.

Structural Model Evaluation (Inner Model)

This evaluation aims to examine the relationships between constructs and the model's predictive power.

1. Multicollinearity Test

This test is conducted to ensure there is no excessive correlation between indicators within a single construct. The criterion used is a Variance Inflation Factor (VIF) <5.0. The analysis results show that all indicator VIF values are below 5.0, thus no serious multicollinearity issues were found.

2. Coefficient of Determination (R²)

The R² value indicates the model's ability to explain the variance in the dependent variable.

- a. External Factors (R² = 0.408): This means that 40.8% of the variation in External Factors can be explained by Internal Strategies. According to Chin (1998), this value is considered moderate.
- b. Women's Readiness (R² = 0.547): This means that 54.7% of the variation in Women's Readiness can be jointly explained by Internal Strategies and External Factors. This value falls into the moderate to strong category.

3. Effect Size (f² Effect Size)

The f² value measures the contribution of the predictor to the dependent variable. Cohen's (1988) criteria are 0.02 (small), 0.15 (medium), and 0.35 (large).

- a. Internal Strategies → External Factors (f² = 0.689): Has a large effect.
- b. External Factors → Women's Readiness (f² = 0.338): Has a near-large effect.
- c. Internal Strategies → Women's Readiness (f² = 0.120): Has a small to moderate effect.

4. Model Fit

Model fit was evaluated using SRMR and NFI.

- a. SRMR = 0.084: This value is below the 0.10 threshold, indicating a good model fit.
- b. NFI = 0.726: This value is in the moderate category, indicating the model is adequately able to replicate the observed data.

Hypothesis Testing and Path Analysis

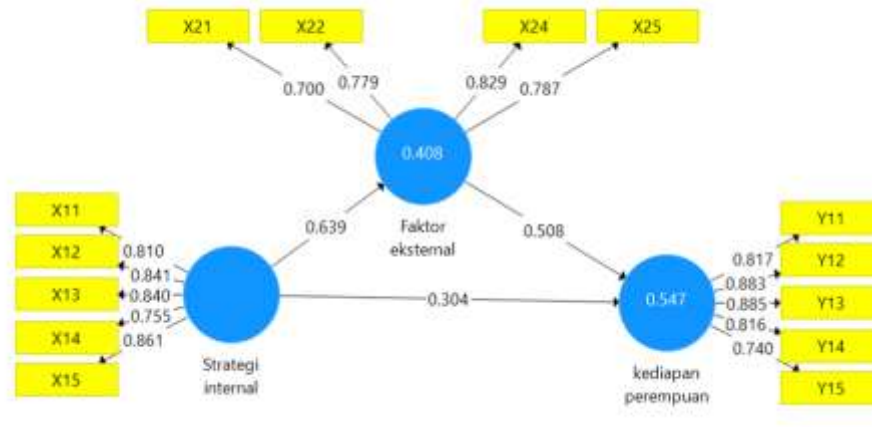


Figure.1 Hypothesis Testing and Path Analysis

Discussion of Hypothesis Results:

- a. Hypothesis 1 (Accepted): Internal Strategy has a positive and highly significant effect on External Factors ($\beta = 0.639$). This finding confirms that internal efforts such as training, planning, and strengthening human resource capabilities directly encourage the development of external supporting factors, such as broader networks, access to resources, and the ability to exploit market opportunities.
- b. Hypothesis 2 (Accepted): External Factors have a positive and highly significant effect on Women's Readiness ($\beta = 0.508$). This means that external support (networking, collaboration, access to information, and policies) is a crucial driver in increasing the readiness of women-owned MSMEs to face technological disruption.
- c. Hypothesis 3 (Rejected): The direct effect of Internal Strategy on Women's Readiness is insignificant and even tends to be negative ($\beta = -0.304$).

Mediation Analysis

Based on the results of the hypothesis testing (H1 and H2 are accepted, H3 is rejected), this model indicates a full mediation effect. This means that the influence of Internal Strategy on Women's Readiness does not occur directly, but rather entirely through the mediation of External Factors.

Interpretation: Internal strengthening efforts (Internal Strategy) will not be effective in increasing Women's Readiness if they fail to create or connect with external supporting factors. In other words, internal training and planning alone are not enough. MSMEs must be able to translate these internal strategies into

tangible networks, productive collaborations, and access to a broader digital ecosystem to be truly prepared for disruption.

DISCUSSION

The Influence of Internal Strategy on External Factors

The first hypothesis (H1), which states that Internal Strategy has a positive and significant influence on External Factors, is accepted. The analysis results show a very strong and positive path coefficient ($\beta = 0.639$). This means that the better and more planned the internal efforts undertaken by women-owned MSMEs—such as participating in training, improving managerial capacity, and adopting an adaptive mindset—the stronger the external support, opportunities, and networks they can build and utilize. These findings align strongly with the Resource-Based View (RBV).

According to the RBV, superior internal capabilities are the primary source of competitive advantage. In this context, "Internal Strategy" is a form of capability development (intangible resources). MSMEs that proactively develop their internal capabilities become more "attractive" to the external environment. They are better prepared to collaborate, better able to identify and seize opportunities, and more trusted by supporting institutions (government, banks, communities). Furthermore, these findings support Social Capital Theory. Internal strategies such as training not only improve technical skills (human capital) but also boost self-confidence and communication skills. This strong human capital serves as the foundation for building social capital, namely networks, trust, and norms that facilitate cooperation for mutual benefit.

These results align with research by Surya et al. (2021), which found that entrepreneurial orientation (an internal capability) significantly boosts MSMEs' ability to build strategic alliances and business networks. This is also in line with Priyono et al. (2020) highlighted that MSMEs with internal adaptive strategies were quicker to connect with the digital ecosystem during the pandemic. This research specifically emphasized that for women-owned MSMEs, the first step in "opening the door" to external support is to strengthen their own "house."

The Influence of External Factors on Women's Readiness

The second hypothesis (H2), which states that external factors have a positive and significant effect on women's readiness, is accepted. This finding shows a strong path coefficient ($\beta = 0.508$), confirming that a supportive external environment is a crucial driver of women's MSMEs' digital readiness. Community support, access to market information, easy access to technology, and conducive government policies directly increase their confidence and ability to adapt to disruption.

This finding is highly relevant to Institutional Theory. This theory states that organizations (including MSMEs) tend to adapt to the pressures and expectations of their institutional environment to be perceived as legitimate and survive. When the digital ecosystem (government, platforms, communities) actively encourages and provides resources for technology adoption, MSMEs will feel compelled (normative and mimetic pressure) to improve their digital readiness.

This finding also aligns with Rogers' Diffusion of Innovation Theory. According to this theory, innovation adoption (in this case, digital readiness) is heavily influenced by communication channels and social systems. "External Factors" in this study serve as these communication channels and social systems. Through networks and communities, women MSMEs gain information, see successful examples from peers (peer effects), and receive technical support that accelerates their readiness.

These results are consistent with the findings of Tambunan (2019) and Sari & Purnomo (2021), who both emphasize the importance of a supportive ecosystem as a determining factor for the success of women MSMEs in the digital era. They argue that without access to external networks and support, women MSMEs are often isolated and left behind.

These findings differ slightly from research that focuses solely on internal factors (such as individual motivation) as the primary determinant of readiness. This research shows that no matter how strong internal motivation is, its impact will be blunted without a bridge to external resources.

Direct Effect of Internal Strategy and Mediating Effect of External Factors

The third hypothesis (H3), which states that Internal Strategy has a direct effect on Women's Readiness, was rejected. The analysis results showed an insignificant path with a negative coefficient ($\beta = -0.304$). This finding, combined with the acceptance of H1 and H2, confirms the existence of a full mediation effect. This is the most important finding of this study. Interpretation and Theoretical Support: The rejection of this direct effect indicates a "broken bridge" phenomenon. Internal strategies such as training and planning alone are not sufficient to make women's MSMEs digitally ready.

These efforts must be able to translate into tangible results in the external environment (e.g., new networks, access to platforms, or collaboration). Without this conversion, internal strategies may simply remain "head knowledge" that cannot be applied. The negative coefficient (although not significant) may even suggest that if internal strategies do not generate external connections, it can lead to frustration or a feeling of "trying but getting nowhere," which can actually slightly lower perceptions of readiness.

This full mediation finding beautifully integrates the RBV and Social Capital Theory. The RBV explains "what needs to be built" (internal capabilities), while Social Capital Theory explains "how those capabilities are used" (to build external networks). This research demonstrates that the process is sequential: build internal capabilities (RBV), use those capabilities to build networks and access external resources (Social Capital), and these networks ultimately drive digital readiness.

Many studies often test the direct relationship between training (internal strategy) and performance/readiness (outcome) and find a positive relationship. However, this research provides a deeper perspective by demonstrating that the relationship is not straightforward. This finding suggests that previous studies may have overlooked the crucial role of mediators such as the external environment.

The main contribution of this research is empirically demonstrating that for women-owned MSMEs, external factors are not merely supporting factors but rather a necessary bridge. Empowerment programs that focus solely on classroom training without actively connecting participants to the industry ecosystem will have limited impact.

CONCLUSIONS AND RECOMMENDATIONS

Based on the data analysis and discussion outlined above, this study produces three main conclusions to address the research problem:

1. Internal strategies significantly drive the formation of supportive external factors.

It was found that internal efforts undertaken by female MSMEs, such as competency development, human resource planning, and managerial adaptation, have a positive and powerful influence on building and expanding networks, accessing resources, and exploiting opportunities in the external environment.

2. External factors are the primary drivers of women's readiness to face digital disruption.

Support from the ecosystem—including the community, government, access to technology, and market information—has been shown to directly and significantly increase the readiness, confidence, and capability of female MSMEs to adapt and compete in the digital era.

3. The influence of internal strategies on women's readiness is not direct but is entirely mediated by external factors.

This is the most crucial finding of this study. Internal strengthening efforts alone are not sufficient to improve digital readiness. Their impact will only be felt after these efforts are successfully converted into social capital and access to external resources. In other words, external factors serve as a necessary bridge, connecting the development of internal capabilities with adaptive readiness at the practical level.

FURTHER STUDY

Based on the limitations above, several future research directions can be suggested:

1. Longitudinal Studies: Conducting research that tracks the development of MSMEs over a specific period of time to concretely observe how internal strategy processes influence the development of external factors and ultimately impact digital readiness.
2. Qualitative or Mixed Approaches: Complementing quantitative findings with case studies or in-depth interviews to further explore the "why" and "how" external factors become such important mediators.
3. Expanding the Research Model: Adding other relevant variables, such as digital financial literacy, family support, or the intensity of market competition as moderating or control variables to obtain a more comprehensive picture.

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REFERENCES

- Adisaksana, H. (2022). The Effect of Digital Transformation, Business Innovation Models, and Creativity on MSME Performance with Competitive Advantage as Intervening Variable. *Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE)*, 5(2), 608–629.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295–336). Lawrence Erlbaum Associates Publishers.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Fahriyah, F., Sudarmi, S., & Purnomo, A. (2021). Strategi Pengembangan Sumber Daya Manusia pada Usaha Mikro Kecil Menengah (UMKM) di Era Digital. *Jurnal Ilmiah Mahasiswa FEB*, 9(2).
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Sage Publications.
- Hendrawan, S. A., Chatra, A., Iman, N., Hidayatullah, S., & Suprayitno, D. (2024). Digital Transformation in MSMEs: Challenges and Opportunities in Technology Management. *Jurnal Informasi Dan Teknologi*, 6(2), 141–149. <https://doi.org/10.60083/jidt.v6i2.551>
- Kementerian Koperasi dan UKM. (2024). *Data UMKM Terbaru 2023-2024*. Diakses dari <https://kemenkopukm.go.id/data-umkm/>
- Kementerian Koordinator Bidang Perekonomian. (2022). *Perkembangan Ekonomi Digital dan UMKM*. Siaran Pers. Jakarta: Kemenko Perekonomian.
- Kementerian Pemberdayaan Perempuan dan Perlindungan Anak (KemenPPPA). (2023). *Profil Perempuan Pengusaha Indonesia 2023*. Jakarta: KemenPPPA.
- Kurniawati, E., Idris, I., & Handayati, P. (2021). Digital transformation of MSMEs in Indonesia during the pandemic. *Entrepreneurship and Sustainability Issues*, 9(2), 316–331. [https://doi.org/10.9770/jesi.2021.9.2\(21\)](https://doi.org/10.9770/jesi.2021.9.2(21))
- Nashir, M. M., Prasetyo, B. A., & Muhibban. (2025). Peran Teknologi Informasi Dalam Transformasi Bisnis UMKM Daerah Depok. *Gudang Jurnal Multidisiplin Ilmu*, 3(1), 769–774.
- Nursini, N. (2020). Micro, small, and medium enterprises (MSMEs) and poverty reduction: empirical evidence from Indonesia. *Development Studies Research*, 7(1), 153–166. <https://doi.org/10.1080/21665095.2020.1823238>
- Panjaitan, P. D., Simatupang, T. M., & Hidayat, S. (2024). The Role of Digital Marketing on MSMEs Business Performance: A Literature Review. *International Journal of Professional Business Review*, 9(2), e04034.
- Priyono, A., Moin, A., & Putri, V. N. A. O. (2020). Identifying digital transformation paths in the business model of SMEs during the COVID-19

- pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 104. <https://doi.org/10.3390/joitmc6040104>
- Rafidah, R. (2024). The Effect of Adopting E-Commerce on the Performance of MSMEs: An Empirical Study in Indonesia. *International Journal of Data and Network Science*, 8(1), 47–56.
- Sari, D. P., & Purnomo, B. H. (2021). The role of government support and digital ecosystem on the resilience of women-led MSMEs in Indonesia. *International Journal of Business and Society*, 22(3), 1315–1332.
- Singh, R. K., Garg, S. K., & Deshmukh, S. G. (2008). Strategy development by SMEs for competitiveness: a review. *Benchmarking: An International Journal*, 15(5), 525–547. <https://doi.org/10.1108/14635770810903132>
- Siregar, R., & Sudarmanto, E. (2023). Beyond Traditional Boundaries: Embracing Digital Transformation for Enhanced Management Efficiency at Micro and Small Business Enterprises. *West Science Interdisciplinary Studies*, 1(06), 267–279.
- Sitompul, C., Pailis, E. A., Simatupang, D. M. D., & Purba, J. T. (2024). The Role Of Digital Transformation As A Driver Of MSME Competitiveness. *International Journal of Economic Literature*, 2(2), 481-490.
- Surya, B., Menne, F., Sabhan, H., Suriani, S., Abubakar, H., & Idris, M. (2021). Economic Growth, Increasing Productivity of SMEs, and Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 20. <https://doi.org/10.3390/joitmc7010020>
- Tambunan, T. (2019). Recent evidence of the development of micro, small and medium enterprises in Indonesia. *Journal of Global Entrepreneurship Research*, 9(1), 18. <https://doi.org/10.1186/s40497-019-0140-4>
- Widiawati, S., Sumiati, A., & Herawati, N. (2022). The Role of Women in Micro, Small, and Medium Enterprises (MSMEs) for Family Economic Resilience. *Journal of Governance and Public Policy*, 9(2), 115-125.