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A strategic model for women entrepreneurs: Digital literacy, resources, and innovation in enhancing MSME performance

Almu Zahwa[1], Mohammad Riza Sutjipto[2], Dwi Fitrizal Salim[3*]
[1,2,3]School of Economics and Business, Telkom University, Bandung, Indonesia; dwifitrizalslm@telkomuniversity.ac.id (D.F.S.).

Abstract: This study aims to develop a strategic framework to improve the performance of women-led Micro, Small, and Medium Enterprises (MSMEs) through digital transformation. It explores the relationships between digital literacy, company resources, digital innovation, and business performance. A quantitative method was applied using Partial Least Squares Structural Equation Modeling (PLS-SEM) on survey data from members of the Indonesian Businesswomen Association (IWAPI) in West Java. The findings demonstrate that both digital literacy and company resources have significant positive effects on business performance, with digital innovation playing a key mediating role. Specifically, businesses with higher levels of digital literacy and well-managed resources tend to implement more effective digital innovations, leading to improved operational efficiency, increased sales, and stronger market competitiveness. This research offers a practical contribution by highlighting the need for structured training and policy support to foster digital capabilities in women-led MSMEs. The proposed framework provides actionable insights for policymakers and organizations like IWAPI in formulating initiatives that promote sustainable digital entrepreneurship. The study concludes that enhancing digital readiness is vital for driving innovation and ensuring the resilience and competitiveness of women entrepreneurs in the evolving digital economy.

Keywords: *Business performance, Company resources, Digital innovation, Digital literacy, Msmes, Women entrepreneurs.*

1. Introduction

In developing countries, women entrepreneurs are key drivers of economic growth and job creation. However, they face systemic challenges, including limited access to funding, technology, and entrepreneurial training [1]. Women's participation in entrepreneurship is steadily increasing, yet socio-economic barriers and low digital literacy continue to hinder their progress [2]. In the digital era, women-led Micro, Small, and Medium Enterprises (MSMEs) contribute significantly to economic development through job creation and income generation. However, their competitiveness is constrained by challenges related to digital technology adoption and business strategy [3, 4].

The Indonesian Women Entrepreneurs Association (IWAPI) West Java plays a crucial role in empowering women entrepreneurs and integrating them into the digital economy. As a non-profit organization, IWAPI has launched various programs to promote digital technology adoption among its members. These initiatives aim to enhance market access, optimize operational efficiency, and strengthen business competitiveness at both local and national levels. Additionally, IWAPI provides training programs to improve members' digital literacy and business skills, equipping them with the necessary competencies to navigate evolving market conditions. Despite these efforts, digital technology adoption remains inconsistent, with many MSMEs yet to fully integrate digital innovations into their operations.

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* Correspondence: dwifitrizalslm@telkomuniversity.ac.id

Women-led MSMEs in IWAPI continue to face substantial challenges in adapting to the digital ecosystem, including inadequate digital literacy, limited financial resources, and intense competition on digital platforms. A study involving 10 IWAPI West Java members revealed that many MSMEs struggle to increase product visibility in the marketplace. These businesses face stiff competition from both local enterprises and lower-priced imported products. This issue is exacerbated by rapid technological advancements that are reshaping business models, consumer behavior, and market expectations. Given these challenges, adopting digital commerce technologies is essential for improving competitiveness. In today's market, customers prioritize convenience, speed, and affordability, which digital technologies facilitate.

To enhance their competitiveness, women-led MSMEs must adopt digital commerce technologies such as e-commerce platforms, electronic wallets, delivery services, and transaction management applications. Furthermore, the growing implementation of innovative business models—such as QR code payments, cash on delivery, deferred payment options, and customer loyalty programs—highlights the crucial role of digital transformation. However, challenges such as limited digital literacy and insufficient access to technological resources continue to hinder businesses from fully transitioning away from traditional marketing, sales, and financial management practices.

Several key factors influence the success of women-led MSMEs in IWAPI, including inadequate human capital, limited financial resources, and substandard product quality [5, 6]. Organization resources — both tangible (such as capital and labor) and intangible (such as human resource competencies and service excellence) — are fundamental elements of a competitive business strategy [7]. Proficiency in digital tools enhances operational effectiveness and boosts market competitiveness [6]. In addition, there is a significant correlation between digital literacy and small business performance, particularly in terms of financial accessibility [5].

While previous research has analyzed these factors in broader contexts, studies specifically investigating the interrelated effects of digital literacy, company resources, and digital innovation on the success of women-led MSMEs in IWAPI, West Java, remain scarce. To date, no theoretical framework has been tailored to capture the distinct attributes of IWAPI and the obstacles encountered by its members. This study seeks to formulate a strategic framework that elucidates the connections among digital literacy, company resources, and digital innovation, as well as their combined influence on the performance of women-led MSMEs.

Expanding upon previous research, this model specifically addresses the digital transformation needs of IWAPI MSMEs, ensuring more relevant and actionable insights. By identifying key enablers and barriers, this study will provide strategic recommendations for IWAPI to develop targeted programs that promote digital transformation among its members. Furthermore, it strives to close the current knowledge gap and deliver valuable perspectives to strengthen the competitive edge of women entrepreneurs in the MSME sector. In addition, this research presents policy recommendations for IWAPI and other key stakeholders to support the advancement of digital adoption among women-led MSMEs.

2. Review of Related Literature

The Resource-Based View (RBV) emphasizes that competitive advantage stems from the possession of strategic resources that are valuable, rare, and difficult to imitate [8]. Digital literacy and technological innovation are considered essential assets in strengthening MSME competitiveness. The Comparative Advantage Theory of Competition (CATOC), which is an extension of the Resource Advantage Theory of Competition (RATOC), states that effective resource utilization enhances operational efficiency and market positioning, ultimately driving financial success [9]. In addition, Industrial Organization Theory explains that competitive positioning is influenced by a combination of internal capabilities and external market dynamics, including industry competition and regulatory frameworks [10].

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This study proposes that the relationship between MSME performance, company resources, and digital literacy is mediated by digital innovation. Business Performance Theory defines business performance as the achievement of organizational objectives through enhanced operational effectiveness and efficiency [11]. Therefore, increasing digital literacy and optimizing the management of company resources are expected to drive digital innovation, fostering MSME growth and competitiveness.

Digital literacy refers to an individual's capability to effectively navigate digital technology, including the skills to access, interpret, analyze, assess, and share information [12, 13]. Several studies emphasize its significant influence on MSME business outcomes. Digital literacy facilitates e-commerce adoption, broadens market reach, and boosts sales [14, 15]. Moreover, digital literacy training enables MSMEs to integrate digital solutions and enhance online business operations [16, 17]. Proficiency in digital literacy contributes to improved operational efficiency and strengthens business competitiveness [6].

However, research findings on this topic remain inconsistent. Several studies show that digital literacy does not always significantly influence MSME performance, as its effectiveness is often shaped by industry characteristics and external environmental conditions [18-20]. Considering these variations, this research seeks to explore the relationship between digital literacy, MSME performance, and digital innovation among IWAPI West Java members in greater depth.

H_1: Digital literacy influences business performance.

Company resources, both tangible and intangible, play a fundamental role in determining MSME competitiveness and long-term business sustainability. Resources are typically classified into two categories: intangible assets, such as intellectual capabilities and business reputation, and physical assets, including hardware and manufacturing facilities [21]. When properly managed, these resources contribute to long-term competitive advantage. Several studies have indicated that company resources mediate business-to-business collaboration and financial success, thereby driving export growth [22-24]. Other research emphasizes the importance of intangible assets and technological investments in achieving corporate success [25-27]. In addition, IT competencies and intellectual capital have been shown to improve operational efficiency and sustain long-term business performance [28, 29]. Social capital and strategic planning are also considered influential factors in determining business competitiveness [30-32].

However, some studies present contrasting perspectives, indicating that resource capabilities, financial access, and entrepreneurial competencies do not always guarantee positive business performance, as their impact largely depends on contextual factors and managerial strategies [33-35].

H_2: Company resources influence business performance.

Digital innovation refers to the creation of new value through generativity, digital technology, and recombination [35]. It also encompasses the development of value propositions, user experience design, and digital evolution-based improvisation [36]. Prior studies have demonstrated that digital innovation enhances labor efficiency, reduces operational costs, and strengthens competitiveness [37, 38]. Furthermore, digital innovation is recognized as a key driver for improving company performance [39-41]. The process of digital innovation generally follows three pathways: enhancing labor efficiency, reducing operational costs, and establishing competitive advantage [42]. Nonetheless, some studies suggest that the effectiveness of digital innovation is limited in companies with restricted access to technological resources.

H_3: Digital innovation influences business performance.

Digital literacy plays a crucial role in supporting digital innovation by enabling MSMEs to adopt emerging technologies. As shown by Puteri and Asyari [43] digital literacy acts as a mediating factor in digital transformation, facilitating the revitalization of MSMEs. In addition, Farhan, et al. [44] assert that both digital literacy and an entrepreneurial mindset enhance performance and competitiveness through digital innovation. Although the role of financial literacy remains a subject of debate, Desmiyawati, et al. [45] highlighted the importance of digitalization in improving MSME

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performance. Likewise, Suryani, et al. [14] found that e-commerce adoption, driven by digital literacy, positively influences MSME business outcomes.

H_4: Digital literacy influences digital innovation.

Digital innovation is further strengthened when supported by company resources, including digital capabilities, technological investments, and organizational culture. Studies by Wicaksono, et al. [28] and Hidayat, et al. [29]confirm that digital capabilities significantly affect digital innovation across industries. Similarly, Hartono and Halim [46] identified comparable trends within the e-travel and ISP sectors. Furthermore, research by Kiefer, et al. [47] and Lokuge and Duan [48] demonstrates that an innovation-friendly organizational culture fosters digital innovation by encouraging internal collaboration and corporate entrepreneurship. Other studies Soluk [49] and Alvarado-Vargas, et al. [50] highlight the importance of adaptive resource allocation and flexible organizational structures in accelerating digital transformation. In line with this, Nepelski [51] emphasize the relevance of technical, managerial, and financial skills in supporting digital innovation within MSME ecosystems.

H_5: Company resources influence digital innovation.

Digital literacy and company resources are both essential for improving business performance, especially through digital innovation. According to Wang, et al. [52] and Yasa, et al. [37] innovation-driven digital capabilities have a positive impact on MSME performance. Additionally, Firmansyah, et al. [53]; Anggitasari, et al. [18] and Tatli, et al. [6] emphasize that digital literacy supports business growth by fostering employee creativity and entrepreneurial innovation.

H_6: Digital innovation mediates the relationship between digital literacy and business performance.

Firm resources are also crucial in driving business success, particularly when digital innovation serves as a mediating factor [54]. Moreover, Truong and Nguyen [55] found that knowledge absorption capacity and intellectual capital contribute significantly to both innovation and regulatory compliance, both of which enhance corporate performance.

H7: Digital innovation mediates the relationship between company resources and business performance.

The research framework presented in Figure 1 illustrates the relationships between the variables in accordance with the hypotheses formulated.

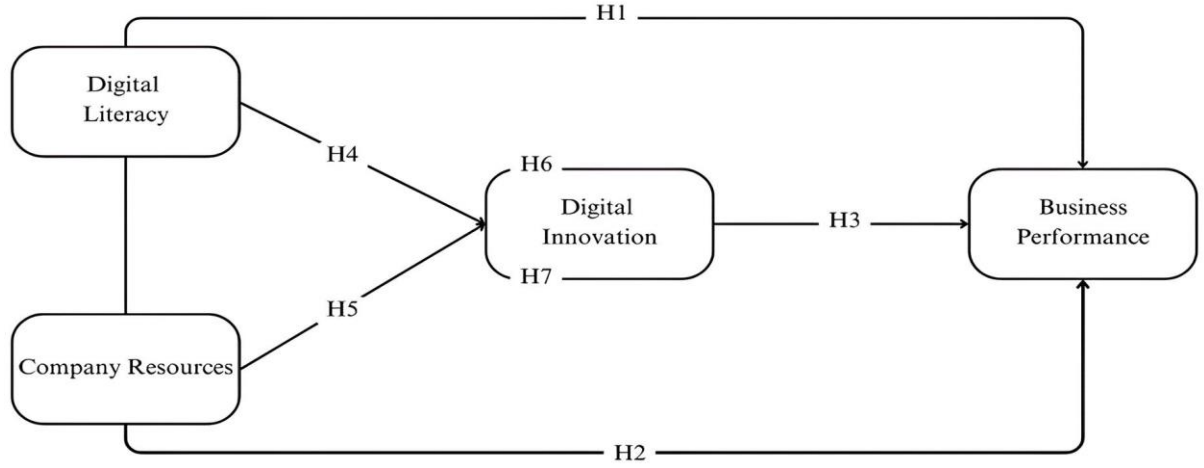

Figure 1.
Conceptual Model.

3. Methods and Techniques Used

A quantitative approach is applied to analyze the influence of digital literacy and company resources on digital innovation and their role in enhancing the business performance of IWAPI West Java-

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affiliated MSMEs. The measurement of digital literacy refers to a model that encompasses ten key dimensions, including information access, analysis, verification, production, and digital content distribution [13]. The evaluation of company resources is based on a model covering both tangible and intangible assets [21]. Similarly, digital innovation is defined according to the framework highlighting generativity, recombination, user experience, and improvisation [56]. Business performance is measured through indicators such as sales growth, profitability, market share, and customer satisfaction. Table 1 presents the measurement indicators for each construct examined in this study.

Table 1.
Operationalization of Variables.

Variable	Code	Indicator
Digital Literacy	1DLT	Ability to search for information from various sources.
	2DLT	Ability to operate digital devices or social networking sites.
	3DLT	Ability to select information media available on the internet.
	4DLT	Ability to understand the information obtained.
	5DLT	Ability to analyze the positive and negative aspects of disseminated information.
	6DLT	Ability to double-check the accuracy of obtained information.
	7DLT	Ability to think critically before disseminating information.
	8DLT	Ability to categorize information based on audience and appropriate distribution channels.
	9DLT	Ability to create digital content.
	10DLT	Active in monitoring social media or other media platforms.
	11DLT	Participation in digital literacy campaigns with other institutions.
Company Resources	1COR	Ease of obtaining financial support.
	2COR	Availability of adequate product/service facilities.
	3COR	Well-established product/service distribution networks.
	4COR	Sufficient human resources.
	5COR	Adequate technological infrastructure.
	6COR	Ability to build and maintain a strong company reputation among customers.
	7COR	Proficiency in information technology (IT).
	8COR	Capability to build business relationships and networks.
	9COR	Availability of market and technology-related information resources.
	10COR	Human resource capability to drive innovation.
Digital Innovation	1DGI	Implementation of digitalization to store information in digital form.
	2DGI	Adoption of digitalization by utilizing digital technologies extensively.
	3DGI	Digitalization integration enhances the company's ability to innovate.
	4DGI	Ability to create new digital content.
	5DGI	Flexibility in using the right digital technology to seize business opportunities and challenges.
	6DGI	Development of user-friendly products.
	7DGI	Incorporation of aesthetic elements that evoke positive emotional responses in products/services.
	8DGI	Creation of products through customer involvement to enhance user experience.
	9DGI	Implementation of appropriate customer segmentation.
	10DGI	Proper bundling of products.
	11DGI	Continuous adaptation to relevant digital technology advancements.
	12DGI	Ownership of effective digital marketing channels.
	13DGI	Consideration of emerging user behavior in the market.
	14DGI	Encouragement of learning about digital technology developments.
	15DGI	Forming teams with an optimal combination of skills suited for each digital project.
	16DGI	Establishment of a flexible innovation space.
	17DGI	Coordination mechanisms for improving the innovation process with relevant stakeholders.
Business Performance	1BPF	Increase in sales volume over the past year compared to the previous year, successfully achieving the designated sales target.
	2BPF	Revenue growth in the past year relative to the previous year, aligning with the predetermined target.
	3BPF	Profit growth over the past year compared to the previous year, attaining the established goal.
	4BPF	Attainment of market share goals over the past year in alignment with company objectives.

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This study examines MSMEs affiliated with IWAPI West Java, comprising a total population of 1,518 businesses. A purposive sampling technique was applied to enhance data accuracy and reliability, as suggested in prior research [57]. The sample size was determined using G*Power to ensure sufficient statistical power [58]. This sampling approach was selected to ensure that respondents possess relevant characteristics aligned with the research objectives, which is appropriate for studies focusing on specific groups with shared experiences [57]. This method is particularly useful when the target population is specialized and not randomly distributed, ensuring that the collected data accurately represent the research objectives. The respondents' profiles and business attributes are presented in Table 2.

Table 2.
Respondent Characteristics.

Category	Classification	Percentage
Gender	Male	0%
	Female	100%
Age Group	10–30 years	8.6%
	31–45 years	48.4%
	46–60 years	22.6%
	≥61 years	20.4%
Educational Background	Elementary School	0%
	Junior High School	0%
	Senior High School	26.2%
	Diploma/Bachelor's Degree	60.7%
	Master's/ Doctoral Degree	13.1%
Business Size	Micro Enterprises	71%
	Small Enterprises	23.7%
	Medium Enterprises	5.4%
Years in Business	<1 year	7.5%
	1–5 years	23.7%
	5–10 years	26.9%
	≥10 years	41.9%
Industry Sector	Fashion	15.1%
	Culinary	46.2%
	Services	22.6%
	Trade	15.1%

Questionnaires were used for data collection and analyzed using SmartPLS with the Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach [59]. PLS-SEM was selected for its flexibility in handling diverse indicators, suitability for small samples, and efficiency in analyzing causal relationships involving latent variables [60]. This method is particularly useful for exploratory research and predictive modeling, as it requires neither large sample sizes nor strict data distribution assumptions [61]. Moreover, PLS-SEM is commonly applied in business and management research due to its capability to estimate complex models with multiple relationships and latent variables, making it well-suited for this study.

The research model was evaluated in two stages: the outer model for assessing validity and reliability, and the inner model for testing causal relationships. Construct validity and reliability were assessed using Confirmatory Factor Analysis (CFA) through the outer model, while the inner model tested the proposed hypotheses. PLS-SEM was preferred over Covariance-Based SEM (CB-SEM) for its strength in handling complex models and generating robust results under non-normal data conditions [59].

Research variables were measured using a five-point Likert scale [62]. alidity was assessed using the Average Variance Extracted (AVE) criterion, which must exceed 0.5, while reliability was tested via

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Cronbach's Alpha and Composite Reliability (CR), both of which require values above 0.7 [60]. The careful selection of indicators and rigorous validation ensured the robustness and credibility of the study's findings.

Table 3.
Descriptive Variable.

Variable	Total Score	Ideal Score	Percentage	Category
Digital Literacy	3.277	4.245	77.379%	High
Company Resources	3.032	3.850	78.753%	High
Digital Innovation	4.747	6.545	72.529%	High
Business Performance	1.082	1.540	70.260%	High

Table 3 presents an overview of the descriptive variables.The findings of the descriptive analysis indicate that all variables in this study are classified as "high." Specifically, the relatively high level of digital literacy (77.379%) suggests that respondents possess the ability to understand and utilize technology in business operations, particularly among MSME members of IWAPI West Bandung. Additionally, the high level of company resources (78.753%) signifies that human, technological, and financial capital are well-integrated to support business continuity. Furthermore, the incorporation of technology into MSME operations is evident, as reflected in the digital innovation level reaching 72.529%. The high business performance category (70.260%) highlights the beneficial effects of technology and digital innovation in enhancing business resilience and market advantage.

4. Results

4.1. Measurement Model Evaluation

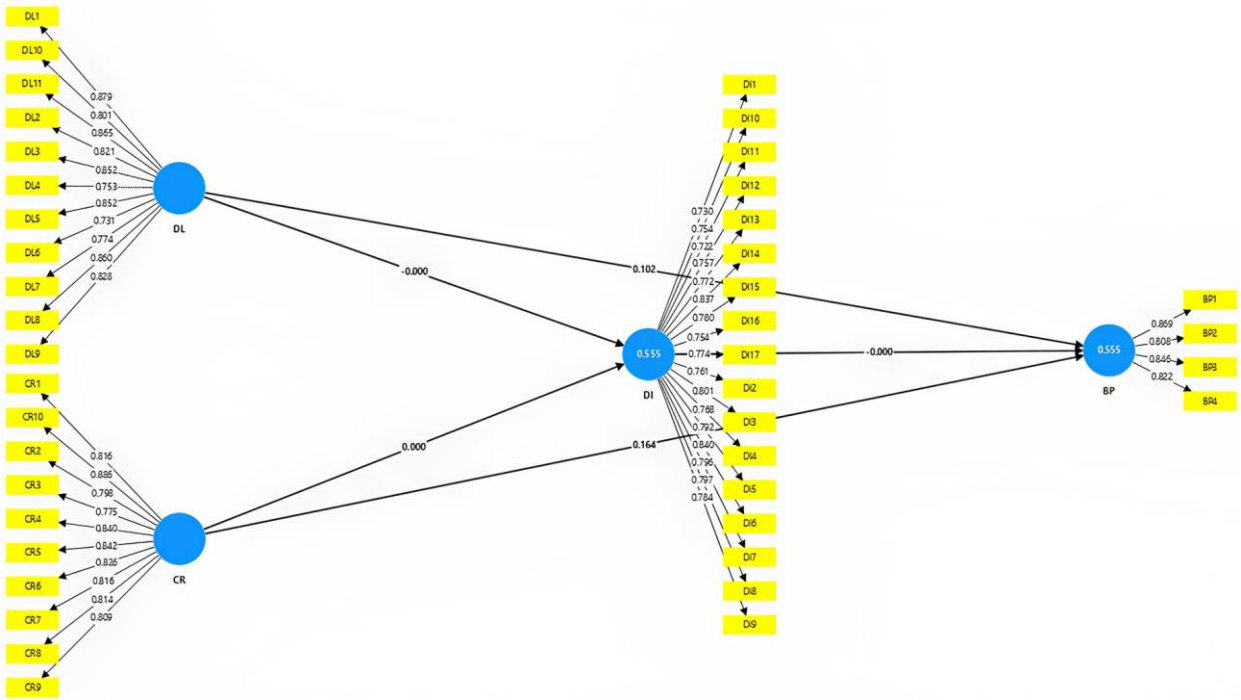

Figure 2.
Measurement Model.

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The evaluation process starts with measuring the model's reliability, followed by an analysis of its structural components. This study utilizes reflective variables and examines them in four phases: evaluating indicator reliability, testing internal consistency, assessing convergent validity, and verifying discriminant validity. The PLS algorithm is utilized for model estimation, with indicator reliability assessed based on outer loading values, as shown in Table 4.

Table 4.
Outer Loading.

	Digital Innovation	Business Performance	Digital Literacy	Company Resources
1DGI	0.730			
2DGI	0.761			
3DGI	0.801			
4DGI	0.768			
5DGI	0.792			
6DGI	0.840			
7DGI	0.796			
8DGI	0.797			
9DGI	0.784			
10DGI	0.754			
11DGI	0.722			
12DGI	0.757			
13DGI	0.772			
14DGI	0.837			
15DGI	0.780			
16DGI	0.754			
17DGI	0.774			
1BPF		0.869		
2BPF		0.808		
3BPF		0.846		
4BPF		0.822		
1DLT			0.879	
2DLT			0.821	
3DLT			0.852	
4DLT			0.753	
5DLT			0.852	
6DLT			0.731	
7DLT			0.774	
8DLT			0.860	
9DLT			0.828	
10DLT			0.801	
11DLT			0.865	
1COR				0.816
2COR				0.798
3COR				0.775
4COR				0.840
5COR				0.842
6COR				0.826
7COR				0.816
8COR				0.814
9COR				0.809
10COR				0.886

Indicator reliability is assessed based on outer loading values. Since all outer loadings exceed 0.7, they meet the criteria for indicator reliability [60]. Consistency across indicators is assessed through Cronbach's Alpha and composite reliability, as shown in Table 5.

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Table 5.
Reliability and Validity.

Constructs	Cronbach Alpha α	CH	CR	AVE
DGI	0.959	0.961	0.963	0.606
BPF	0.857	0.867	0.903	0.699
DLT	0.951	0.954	0.958	0.674
COR	0.947	0.949	0.954	0.677

The consistency of the constructs is assessed through Cronbach's Alpha and composite reliability, both exceeding the 0.7 benchmark, ensuring reliability [60]. Furthermore, the validity of convergence is confirmed using AVE scores, all of which surpass the 0.5 criterion, aligning with the required standard [60]. Discriminant validity is assessed using the Heterotrait-Monotrait approach, as shown in Table 6.

Table 6.
HTMT Value.

Constructs	DGI	BPF	DLT	COR
DGI				
BPF	0.733			
DLT	0.645	0.669		
COR	0.726	0.718	0.641	

The evaluation of discriminant validity is conducted using the Heterotrait-Monotrait approach. As the HTMT values are all below 0.9, the model fulfills the required standard for distinguishing between constructs [60].

4.2. Structural Model Evaluation

Once the measurement model has been assessed, the structural model is evaluated to quantify explanatory power, establish relationships, and determine predictability. The structural model evaluation is conducted in four stages: identifying potential collinearity issues, examining the importance and impact of structural connections, reviewing the model's ability to explain variations, and measuring its predictive strength. Table 7 presents the internal VIF values used to check for collinearity issues. The findings show that all variables exhibit VIF values below 5, indicating no significant collinearity problems in the structural model [60].

Table 7.
Inner VIF Value.

	VIF
DLT → BPF	1.854
COR → BPF	2.206
DGI → BPF	2.248
DLT → DGI	1.629
COR →DGI	1.629

The next stage involved assessing the importance and relevance of structural linkages after confirming the absence of collinearity issues in the structural model. The significance assessment, conducted by analyzing the p-values of both direct and indirect hypotheses testing (Table 8), indicates that all relationships are statistically significant, with p-values below 0.05, confirming their relevance and mediating effects [60].

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Table 8.
Hypotheses Testing and Path Significance.

	Hypotheses	O	M	STDEV	(|O/STDEV|)	P-values	Result
Direct hypotheses							
H 1	DLT → BPF	0.236	0.236	0.105	2.245	0.025	Supported
H 2	COR → BPF	0.287	0.291	0.100	2.871	0.004	Supported
H 3	DGI → BPF	0.324	0.325	0.098	3.316	0.001	Supported
H 4	DLT → DGI	0.316	0.321	0.113	2.807	0.005	Supported
H 5	COR →DGI	0.506	0.511	0.105	4.837	0.000	Supported
Indirect hypotheses							
H 6	DLT → DGI → BPF	0.102	0.106	0.051	2.004	0.045	Supported
H 7	COR → DGI → BPF	0.164	0.167	0.062	2.645	0.008	Supported

To assess how well the model explains variance, its R^2 and f^2 values were calculated. As presented in Table 9, the R^2 values indicate that both business performance and digital innovation have an R^2 of 0.555, indicating that 55.5% of their variation can be accounted for by the model, whereas the remaining portion is affected by external influences. Furthermore, effect size was measured using f^2, which evaluates how much R^2 shifts when a specific variable is excluded from the model.

Table 9.
R square.

	R square	R square adjusted
Digital Innovation	0.555	0.543
Business Performance	0.555	0.537

As presented in Table 10, Digital Innovation exerts a minor impact on Business Performance, with an f^2 value of 0.105. Likewise, Company Resources exhibit a small effect on Business Performance (f^2 = 0.084) but have a substantial impact on Digital Innovation (f^2 = 0.354). Additionally, Digital Literacy exhibits a small effect on both Business Performance (f^2 = 0.068) and Digital Innovation (f^2 = 0.138). These results indicate that Company Resources exert the strongest influence on Digital Innovation, while the other variables play a relatively smaller role in explaining the dependent variables within the model.

Table 10.
f-square.

	Business Performance	Digital Innovation
Digital Innovation	0.105	
Company Resources	0.084	0.354
Digital Literacy	0.068	0.138

5. Discussion

This study is underpinned by several key theoretical frameworks, including RBV, CATOC, and Industrial Organization Theory, which collectively elucidate the relationship between digital capabilities, company resources, and business performance. Based on the Resource-Based View (RBV) Barney [8] strategic assets that possess value, rarity, inimitability, and non-substitutability enable organizations to gain a competitive edge. For MSMEs, such resources encompass technological capabilities, organizational capacities, and digital assets that enhance competitiveness [9]. The Comparative Advantage Theory of Competition (CATOC) argues that optimizing resources enhances market competitiveness and efficiency. Additionally, the Industrial Organization Theory [3]. emphasizes how external elements, including market competition and regulatory frameworks, shape competitive advantage. Similarly, the Business Performance Theory [11]. defines business performance as the achievement of organizational objectives through operational efficiency and effectiveness.

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The test of the first hypothesis shows that digital literacy significantly and positively influences MSME performance. Digital literacy empowers MSMEs to efficiently search for, evaluate, and manage digital information, which enhances decision-making and operational effectiveness. With higher digital literacy, MSMEs can leverage digital tools to broaden market presence, improve customer interactions, and optimize internal processes. This capability ultimately results in improved sales, revenue, and profitability. Furthermore, digital literacy facilitates the adoption of e-commerce platforms, enabling MSMEs to thrive within the digital economy. Prior studies byBahri, et al. [5]; Tatli, et al. [6] and Suryani, et al. [14]. provide empirical support for this relationship, highlighting digital literacy as a key enabler of business success in the digital era.

The second hypothesis suggests that MSME performance is significantly influenced by company resources. Tangible and intangible resources, including financial capability, technological accessibility, and intellectual capital, are critical for ensuring operational efficiency and competitiveness. Financial resources allow businesses to invest in new technologies, expand operations, and improve product and service offerings. Human resources with strong expertise in business and technology have a vital function in sustaining innovation and enhancing customer service. Additionally, access to reliable infrastructure enhances operational effectiveness and ensures seamless business processes. Prior research byAriwibowo, et al. [22]; Lestari and Susanto [32] and Djauhary, et al. [63]. supports this hypothesis, highlighting the essential role of company assets in attaining business success.

The third hypothesis validates digital innovation's strong and favorable effect on MSME performance. The integration of digital innovation enhances efficiency by reducing operational costs, improving workforce productivity, and providing competitive advantages in the market. Digital innovation allows businesses to create innovative offerings, enhance supply chain efficiency, and elevate customer experience via digital platforms. Furthermore, digital innovation strengthens brand positioning, builds customer trust, and enhances market reach. These advantages contribute to long-term business sustainability. Previous studies by Yasa, et al. [37] and Huang, et al. [42]. confirm that digital innovation plays a key role in enhancing MSME performance and ensuring long-term growth.

The fourth hypothesis establishes that digital literacy significantly influences digital innovation in MSMEs. Businesses possessing greater digital literacy tend to adopt new technologies and innovate their processes. Digital literacy enables MSMEs to develop digital marketing strategies, optimize operations, and create new digital products. With a better understanding of digital tools, MSMEs can leverage social media, online marketplaces, and automation technologies to drive innovation. Digital literacy also promotes an environment of ongoing learning and adjustment, which is crucial for maintaining competitiveness in a fast-changing digital environment. Research by Suryani, et al. [14]; Puteri and Asyari [43] and Desmiyawati, et al. [45]. supports this hypothesis, recognizing digital literacy as an essential driver of digital innovation in businesses.

The fifth hypothesis establishes that company resources significantly influence digital innovation in MSMEs. Access to financial, technological, and human resources enhances the ability of MSMEs to adopt and implement digital innovations. Financial resources enable businesses to invest in digital transformation initiatives, while technological resources provide the necessary infrastructure for innovation. Skilled human resources play a role in shaping new business frameworks, digital solutions, and advanced promotional strategies. Additionally, a strong company culture that fosters innovation drives continuous improvements in business operations. These findings align with prior studies by Wicaksono, et al. [28]; Hartono and Halim [46]; Alvarado-Vargas, et al. [50] and Hidayat, et al. [54]. which identify company resources as a crucial factor driving digital innovation in MSMEs.

The sixth hypothesis indicates that digital innovation acts as a bridge in the link between digital literacy and MSME performance. Higher digital literacy facilitates the adoption of digital innovations, which in turn enhances business performance. Digital literacy enables MSMEs to leverage technology for process optimization, customer engagement, and competitive advantage. When MSMEs integrate digital tools effectively, they can improve efficiency, reduce costs, and enhance customer experiences,

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leading to better financial performance. Studies by Tatli, et al. [6]; Anggitasari, et al. [18]; Wang, et al. [52] and Firmansyah, et al. [53] provide empirical evidence that digital innovation enhances the beneficial effect of digital literacy on MSME performance, emphasizing the significance of technological competence for business growth.

The seventh hypothesis confirms the mediating role of digital innovation in linking MSME performance with company resources. Businesses with strong financial, technological, and human resources are better positioned to develop and implement digital innovations, which ultimately enhance business performance. Digital innovations, such as automated processes, data analytics, and e-commerce platforms, enable MSMEs to operate more efficiently and respond to market demands effectively. When MSMEs leverage their resources to drive digital innovation, they gain a competitive edge and achieve sustainable growth. Research by Hidayat, et al. [54]; Truong and Nguyen [55] and Hanelt, et al. [64] supports this hypothesis, highlighting the essential role of digital innovation in enhancing the influence of company resources on business performance.

Overall, this study demonstrates that technology readiness significantly influences MSME performance, contributing to the existing body of knowledge on digital technology adoption among MSMEs, particularly members of IWAPI West Bandung. The findings indicate that technology readiness is not merely a supporting factor but a fundamental driver of MSME competitiveness and sustainability in the digital era. However, this research has certain limitations that create opportunities for future studies. Since it focuses exclusively on MSMEs within IWAPI West Bandung, the findings may not be fully generalizable to MSMEs in other regions, so future research could expand the geographical scope to obtain more comprehensive insights. Additionally, the quantitative survey-based methodology employed in this study may not fully capture qualitative aspects related to the motivations and challenges MSMEs face in adopting digital technology, making qualitative approaches valuable for deeper exploration in future studies. Beyond advancing the understanding of MSME technology readiness, this study establishes a foundation for future research on digital transformation within the MSME sector, and the model could be further refined by incorporating additional factors, such as government support, the digital ecosystem, and technology literacy, allowing for a broader examination of the determinants of technology readiness and their impact on MSME performance.

6. Conslusion

This study confirms that digital literacy and company resources are significant enablers of digital innovation and business performance in women-led MSMEs. Digital innovation plays a pivotal mediating role in enhancing business outcomes, thereby emphasizing the need for integrated strategies that strengthen both internal capabilities and external digital support systems. Women entrepreneurs play a crucial role in economic expansion and job creation, particularly within the MSME sector. This study examines the significant impact of digital literacy, company resources, and digital innovation on the business performance of women entrepreneurs affiliated with IWAPI West Java. The findings indicate that digital literacy facilitates the adoption of new technologies, which in turn drives digital innovation and enhances business operations. Likewise, the effective management of company resources strengthens business competitiveness by improving technological capabilities and optimizing strategic planning. Additionally, this study highlights the mediating role of digital innovation in the relationship between digital literacy, company resources, and business performance, suggesting that the integration of digital innovation enables MSMEs to streamline processes, expand market reach, and enhance competitiveness within the digital economy. Consequently, women entrepreneurs with high digital literacy and effective resource management are more likely to overcome digital transformation challenges and improve business resilience in the competitive market landscape. Despite offering valuable insights, this study has certain limitations, particularly its exclusive focus on IWAPI West Java and reliance on a quantitative methodology, which may not fully capture qualitative aspects. Future research could explore additional elements, such as government support and the digital ecosystem, to

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provide broader perspectives on digital transformation within the MSME sector. This study establishes a foundation for further research while contributing to both theoretical and practical understanding of how digital literacy, company resources, and digital innovation enhance the business performance of women entrepreneurs. Based on the findings, women-led MSMEs can strengthen their digital transformation by investing in targeted training programs, leveraging digital marketing strategies, and improving access to financial and technological resources. Furthermore, policymakers and business associations such as IWAPI should implement structured initiatives to help MSMEs overcome digital adoption challenges, thereby ensuring their long-term competitiveness within the digital economy.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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