

THE INFLUENCE OF DIGITAL TECHNOLOGY USAGE AND ENTREPRENEURIAL ORIENTATION ON FIRM PERFORMANCE WITH THE MEDIATING ROLE OF COMPETITIVE ADVANTAGE: EVIDENCE FROM MSMEs IN INDONESIA

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Abstract: Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in Indonesia's economy, contributing more than 60% to the GDP and absorbing nearly the entire national workforce. However, many MSMEs still face challenges in adopting digital technologies due to limited digital literacy and unequal infrastructure distribution. This situation has caused MSMEs to lag in competitiveness, particularly during the digital disruption era and the COVID-19 crisis, when many businesses were forced to shut down due to the inability to transform. This study aims to examine the influence of digital technology usage and entrepreneurial orientation on firm performance, with competitive advantage serving as a mediating variable. The research was conducted among food-sector MSMEs in East Java using a quantitative approach through a survey of 155 respondents, analyzed with the PLS-SEM method. The results reveal that both digital technology usage and entrepreneurial orientation positively affect competitive advantage. Digital technology directly enhances firm performance, while the direct impact of entrepreneurial orientation is relatively weaker. Competitive advantage functions as a partial mediator that strengthens the relationship between the two independent variables and MSME performance. These findings highlight the strategic importance of digital adoption and entrepreneurial orientation in building sustainable competitive advantage, which ultimately drives business performance improvement in an increasingly competitive environment.

Keywords: MSMEs, digital technology usage, entrepreneurial orientation, competitive advantage, firm performance

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a pivotal role in Indonesia's economic development. In 2023, there were approximately 66 million MSMEs contributing 61% to the national gross domestic product and employing around 97% of the workforce (Kadin Indonesia, 2024). These figures highlight the sector's strategic importance not only in sustaining economic growth but also in ensuring employment stability. At the regional level, East Java stands out as one of the provinces with the largest number of MSMEs, with more than nine million actors operating across various industries such as food and beverages, handicrafts, and services (Dinas Koperasi dan UKM Jawa Timur, 2023). This dominance has positioned MSMEs as the backbone of local economic resilience. Nevertheless, similar to the national context, East Java MSMEs continue to encounter structural challenges in adopting digital technologies comprehensively.

The urgency of digitalization became particularly evident during the COVID-19 pandemic, when many MSMEs were forced to cease operations due to their inability to adapt to crisis-driven market changes. Limited digital literacy, insufficient access to technological infrastructure, and outdated business models remain key barriers hindering effective digital

transformation (Suhayati, 2023). Yet, digital adoption is no longer optional; it is an essential pathway for MSMEs to remain competitive in an increasingly dynamic and disruptive business environment. Digital technology usage enables firms to expand market reach, streamline business processes, automate services, and enhance innovation capacity, all of which ultimately contribute to improving firm performance (Joseph & Suryadi, 2024; Martínez-Caro et al., 2020).

In addition to digitalization, entrepreneurial orientation has also been recognized as a strategic driver of MSME competitiveness. Dimensions such as innovativeness, risk-taking, and proactiveness reflect the entrepreneurial posture necessary to navigate uncertainty and to exploit emerging opportunities in turbulent markets (Aloulou et al., 2024). Firms with a strong entrepreneurial orientation are typically more adaptive, resilient, and capable of making strategic decisions that enhance their overall performance. Together, digital technology usage and entrepreneurial orientation represent internal resources that, according to the Resource-Based View (RBV), can be considered sources of sustainable competitive advantage if they fulfill the VRIN criteria—valuable, rare, inimitable, and non-substitutable (Barney, 1991; Mailani et al., 2024).

Despite the significance of these factors, prior studies tend to examine digitalization, entrepreneurial orientation, competitive advantage, and firm performance in isolation. The integrative mechanisms through which digital technology usage and entrepreneurial orientation contribute to firm performance via the development of competitive advantage remain underexplored. This gap underscores the need for a comprehensive framework that not only identifies direct relationships but also explains the mediating role of competitive advantage in linking digital and entrepreneurial resources with organizational performance.

Therefore, this study seeks to fill this empirical and theoretical gap by proposing an integrative model that explores the interplay between digital technology usage and entrepreneurial orientation as strategic resources, their role in shaping competitive advantage, and their ultimate impact on MSME performance. The findings are expected to contribute to the academic literature by advancing the discussion on digital entrepreneurship and firm competitiveness, while also offering practical insights for MSME practitioners and policymakers to design strategies that ensure sustainable growth in the digital era.

2. Literature Review

Resource Based View

The Resource-Based View (RBV) provides a theoretical foundation for understanding how internal resources contribute to sustainable competitive advantage. According to Wernerfelt and Barney (1991), resources can generate long-term value when they are valuable, rare, inimitable, and non-substitutable (VRIN). These resources may include tangible assets, such as technology and infrastructure, or intangible assets, such as knowledge, reputation, and organizational culture. In the context of micro, small, and medium enterprises (MSMEs), RBV has been applied to explain competitiveness, particularly in improving product quality and customer relationships that enhance performance in local and global markets (Indrwati & Astutik, 2025).

Digital Technology Usage

Within this framework, digital technology usage (DTU) is an essential enabler of business transformation. Scholars argue that digitalization is not merely the adoption of technology but a holistic transformation that reshapes processes, decision-making, and organizational structures to achieve efficiency and competitiveness (Obukhova et al., 2020). For MSMEs,

DTU can be observed in practices such as digital finance for accurate bookkeeping and reporting, digital payment systems that facilitate transactions, digital marketing through social media to expand customer reach, and digital platforms such as e-commerce marketplaces that extend market boundaries (Audrey et al., 2023; Trinugroho et al., 2022).

Entrepreneurial Orientation

Entrepreneurial orientation (EO) further strengthens organizational competitiveness by shaping an adaptive and proactive business posture. Defined by innovativeness, risk-taking, and proactiveness (Wales et al., 2020), EO reflects a firm's capacity to anticipate trends, innovate ahead of competitors, and pursue opportunities under uncertainty. EO not only influences strategic decision-making but also contributes to the development of unique internal capabilities aligned with RBV principles (Dionysus & Arifin, 2020). For MSMEs, innovation leads to product differentiation, risk-taking enables exploration of new markets, and proactiveness ensures early responses to customer needs (Al Mamun et al., 2017; Herve et al., 2020).

Competitive Advantage

Competitive advantage, meanwhile, is central to determining firm performance in a competitive environment. Porter in Kuo (2020) outlines three generic strategies—cost leadership, differentiation, and focus—as pathways to build advantage, while RBV highlights the role of firm-specific resources in sustaining it (Mailani et al., 2024). For MSMEs, competitive advantage may manifest in cost efficiency, product uniqueness, or responsiveness to market changes, all of which enhance customer loyalty and long-term profitability (Farida & Setiawan, 2022).

Firm Performance

Firm performance itself reflects the effectiveness and efficiency with which firms utilize their resources to achieve strategic goals. It encompasses financial outcomes such as profitability and revenue growth, alongside non-financial measures such as customer satisfaction and operational effectiveness (Taouab & Issor, 2019). From an RBV perspective, superior firm performance is attained when internal resources are successfully translated into sustained competitive advantage (Novitasari & Agustia, 2023).

DTU, EO, CA Influence to FP

Existing studies suggest that DTU directly improves firm performance by enhancing efficiency, innovation, and market reach (Martínez-Caro et al., 2020). Similarly, EO has been found to positively influence performance by fostering adaptability, innovation, and bold strategic decision-making, particularly crucial for MSMEs facing larger competitors (Amarteifio & Agbeblewu, 2020; Arabeche et al., 2022). Competitive advantage also directly contributes to firm performance, as firms with distinctive capabilities and resources can secure stronger market positions and long-term profitability (Indrwati & Astutik, 2025).

DTU & EO Influence to CA

In addition, DTU has been linked to competitive advantage because digital technologies enable process automation, cost efficiency, and personalized customer experiences, which strengthen firms' strategic positioning (Aloulou et al., 2024; Shahadat et al., 2023). EO similarly enhances competitive advantage by encouraging proactive market behavior, innovation, and

effective resource utilization, which result in unique and hard-to-imitate capabilities (Isichei et al., 2020; Mailani et al., 2024).

CA as Mediating Factor

Competitive advantage is widely considered a mediating factor linking DTU and EO with firm performance. Digital adoption improves performance by creating efficiency and innovation, while entrepreneurial orientation enhances it through strategic proactiveness and adaptability. However, these effects are most powerful when internal resources are transformed into competitive advantage, which then drives superior outcomes in financial and non-financial terms (Arabeche et al., 2022; Novitasari & Agustia, 2023).

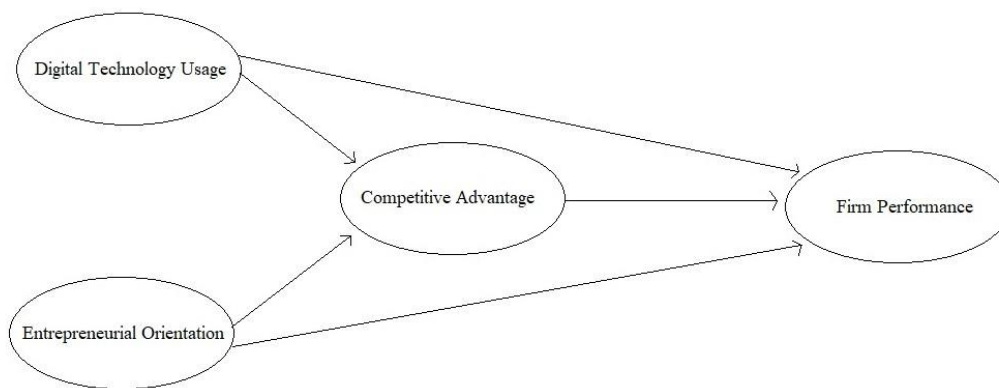


Figure 1: Theoretical Framework
Sources: Adjusted by Author

3. Method

This study applied a quantitative causal design to examine the effects of digital technology usage (DTU) and entrepreneurial orientation (EO) on firm performance (FP), with competitive advantage (CA) as a mediating variable. Data were collected through an online survey using a structured questionnaire with five-point Likert scales, targeting owners or managers of food sector MSMEs in East Java who had been operating for at least one year and had adopted digital technologies in their business operations. A purposive sampling approach was used, yielding 155 valid responses.

The measurement of constructs followed established indicators: DTU (digital finance, payment, marketing, and platform utilization), EO (innovation, proactiveness, and risk-taking), CA (product differentiation, cost advantage, and market responsiveness), and FP (financial and non-financial performance). Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0, which allowed simultaneous assessment of measurement and structural models. Reliability, validity, and mediation effects were tested using composite reliability, factor loadings, average variance extracted, path coefficients, and bootstrapping procedures.

4. Result and Discussion

Result

This study collected responses from 155 SMEs in East Java engaged in the food sector. Respondents were mostly business owners (66%), male (55%), and aged between 25–44 years

(60%). The majority of businesses had been operating for 4–6 years (38%), with annual revenues below IDR 2 billion (73%), classifying them as micro-enterprises.

Table 1. Responden Characteristics

Variable	Category	Frequency	%
Age	< 25 years	23	15
	25–34 years	48	31
	35–44 years	45	29
	45–54 years	23	15
	> 55 years	16	10
Gender	Male	85	55
	Female	70	45
Business tenure	< 1 year	6	4
	1–3 years	52	34
	4–6 years	59	38
	7–10 years	22	14
	> 10 years	15	10
Annual revenue	< IDR 2 billion	113	73
	IDR 2–15 billion	36	23
	IDR 15–50 billion	6	4
Position in business	Owner	103	66
	Manager/Co-owner	20	13
	Employee	32	21

Sources: DeVised by the authors.

Descriptive statistics showed that the four main constructs were positively perceived by respondents: Digital Technology Usage (mean = 4.17), Entrepreneurial Orientation (mean = 3.93), Competitive Advantage (mean = 4.12), and Firm Performance (mean = 4.04). These results suggest that SMEs generally agreed that adopting digital tools, entrepreneurial practices, and competitive strategies enhanced their business performance.

Table 2. Descriptive Statistics of Constructs

Construct	Mean	Interpretation
Digital Technology Usage (DTU)	4.17	Agree
Entrepreneurial Orientation (EO)	3.93	Agree
Competitive Advantage (CA)	4.12	Agree
Firm Performance (FP)	4.04	Agree

Sources: data output

Measurement model testing (outer model) confirmed that all constructs met validity and reliability requirements ($AVE > 0.5$, Composite Reliability > 0.7 , Cronbach's Alpha > 0.7). Some indicators under Digital Marketing and Entrepreneurial Orientation showed weaker loadings but remained within the acceptable range. Discriminant validity (HTMT < 0.90) was satisfied, and no multicollinearity issues were found ($VIF < 5$).

The structural model (inner model) demonstrated significant direct effects: Digital Technology Usage ($\beta = 0.463$, $p < 0.001$), Entrepreneurial Orientation ($\beta = 0.154$, $p < 0.05$), and Competitive Advantage ($\beta = 0.247$, $p < 0.01$) on Firm Performance. Both Digital Technology Usage ($\beta = 0.360$, $p < 0.001$) and Entrepreneurial Orientation ($\beta = 0.522$, $p < 0.001$) significantly influenced Competitive Advantage. Indirect effects were also significant, indicating that Competitive Advantage partially mediated the relationships between both DTU–FP and EO–FP. The model demonstrated substantial explanatory power ($R^2 = 0.627$ for Firm Performance; $R^2 = 0.669$ for Competitive Advantage) with strong predictive relevance ($Q^2 > 0.35$ for FP).

Table 3. Validity and Reability Test

Variable	<i>Cronbach's Alpha</i>	<i>rho_A</i>	<i>Composite Reliability</i>	AVE	Remarks
Digital Technology Usage	0.792	0.794	0.861	0.56	Valid
Entrepreneurial Orientation	0.875	0.894	0.899	0.501	Valid
Competitive Advantage	0.82	0.83	0.869	0.528	Valid
Firm Performance	0.898	0.905	0.922	0.664	Valid

Sources: data output

Table 4. Discriminant Validity (HTMT)

Construct Pair	HTMT	Criterion	Result
DTU – CA	0.872	< 0.90	Valid
EO – CA	0.86	< 0.90	Valid
DTU – EO	0.826	< 0.90	Valid
FP – DTU	0.885	< 0.90	Valid
FP – CA	0.783	< 0.90	Valid
FP – EO	0.723	< 0.90	Valid

Sources: data output

Table 5. Model Fit: R^2 , Q^2

Endogenous	R Square	R Square Adjusted	SSO	SSE	Q2
Competitive Advantage	0.669	0.665	930	625.646	0.327
Firm Performance	0.627	0.62	930	556.101	0.402

Sources: data output

Discussion

The findings highlight the crucial role of digital technology in enhancing SMEs' performance. Consistent with Zhao et al. (2024), digital adoption improves operational efficiency and market

reach, which in turn strengthens firm performance. In the context of East Java SMEs, tools such as POS systems, e-commerce platforms, and social media marketing provide valuable resources that align with the resource-based view (RBV) framework, being valuable, rare, inimitable, and non-substitutable.

Entrepreneurial Orientation, although statistically significant, had a weaker direct effect on performance. This aligns with studies by Kiyabo & Isaga (2020) and Kraus et al. (2012), which emphasized that entrepreneurial traits must be supported by resources and capabilities to translate into performance outcomes. In practice, East Java SMEs still face constraints in capital, managerial skills, and innovative capacity, which may explain the weaker effect.

Competitive Advantage showed a positive but modest influence on firm performance. Similar to Potjanajaruwit (2018) and Novitasari & Agustia (2023), differentiation, cost efficiency, and responsiveness provided SMEs with market leverage, but their direct impact on performance remained limited without continuous innovation and digital integration.

Importantly, Competitive Advantage acted as a partial mediator. This suggests that digital adoption and entrepreneurial orientation improve performance not only directly but also through enhanced competitiveness. As argued by Al-Omush et al. (2023) and Sudirjo & Sulistiyani (2023), digital tools and entrepreneurial behaviors must be strategically leveraged to create unique value propositions, enabling SMEs to sustain growth in competitive markets. Overall, these findings reinforce the notion that SMEs' digital transformation and entrepreneurial drive are necessary but insufficient without being channeled into sustainable competitive strategies. Policymakers and SME support programs should therefore focus not only on promoting technology adoption but also on capacity building for innovation, risk management, and competitive positioning.

Table 6. Structural Model Results (Direct and Indirect Effects), Effect Size

Path	β	t-value	p-value	Hypothesis	Result	f ²	Effect Size
DTU → FP	0.463	7.824	0.0	H1	Sig.	0.238	Medium
EO → FP	0.154	2.39	0.017	H2	Sig.	0.022	Weak
CA → FP	0.247	2.801	0.005	H3	Sig.	0.054	Weak
DTU → CA	0.36	4.645	0.0	H4	Sig.	0.194	Medium
EO → CA	0.522	7.236	0.0	H5	Sig.	0.407	Strong
DTU → CA → FP	0.089	2.616	0.009	H6	Sig.		
EO → CA → FP	0.129	2.442	0.015	H7	Sig.		

Sources: Data Output

5. Conclusions

This study highlights the pivotal role of digital technology usage and entrepreneurial orientation in enhancing the performance of micro, small, and medium enterprises (MSMEs). The findings reveal that digital technology significantly and positively influences both firm performance and competitive advantage, whereas entrepreneurial orientation exerts a strong positive effect on competitive advantage but only a weaker impact on firm performance. Moreover, competitive advantage is confirmed as a mediating factor between digital technology usage and firm performance, as well as between entrepreneurial orientation and

firm performance. These results reinforce the argument that the integration of digital technologies and entrepreneurial orientation, when aligned with sustainable competitive strategies, is essential for MSMEs to thrive in an increasingly dynamic business environment. Nonetheless, the study acknowledges limitations related to the restricted sectoral and geographical scope, which suggests the need for further research using broader datasets and longitudinal approaches to validate and extend these insights.

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