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Building Competitive Advantage through Digital Entrepreneurial Orientation in the Industry 5.0 Era

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Abstract

Purpose: This study aims to comprehensively analyze the influence of entrepreneurial orientation on competitive advantage and examine the mediating role of technological capabilities and social media engagement in this relationship in food and beverage MSMEs in Tangerang City and South Tangerang.

Research Methodology: This study uses a quantitative approach with an explanatory design. The research sample consisted of owners or managers of MSMEs involved in business decision-making. The sample size was set at 190 respondents. Data analysis was carried out using method based on SEM-PLS.

Results: Entrepreneurial orientation has a significant effect on competitive advantage, technological capabilities, and social media engagement. In addition, social media engagement is proven to have a significant effect on competitive advantage, indicating that MSMEs. However, technological capabilities do not have a direct significant effect on competitive advantage. The mediation results also show that social media engagement can mediate the relationship between entrepreneurial orientation and competitive advantage, while technological capabilities can not act as a mediator in the relationship.

Conclusions: Strong entrepreneurial orientation can encourage MSMEs to be more adaptive, innovative, and responsive to market changes.

Limitations: The scope of the study focused only on food and beverage MSMEs in Tangerang City and South Tangerang; therefore, the results cannot be generalized to other business sectors or different regions.

Contributions: This study offers a recent theoretical perspective by highlighting social media engagement as a key mechanism linking entrepreneurial orientation to competitive advantage in MSMEs.

Keywords: *Competitive Advantage, Entrepreneurial Orientation, Social Media Engagement, Technological Capabilities*

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1. Introduction

Industry 5.0 is a phase of revolution that focuses on intelligent technologies, such as IoT, AI, and big data that are integrated with each other, to increase productivity and efficiency in the industrial world (Demarchi, Bonello, Francalanza, & Rauch, 2024). In this era, technological innovation not only changes the way we produce but also the way we do business and interact with customers . As a

continuation of 4.0, with a focus on digitalization and big data analysis, while industry 5.0 seeks to create competitive added value through collaboration between humans and machines (Latino, 2025).

In Indonesia, one of the main pillars of the economy is the Micro, Small, and Medium Enterprises (MSMEs), including the strategic food and beverage sector. MSMEs in the food and beverage sector contribute significantly to the economy, both in terms of employment and economic growth (BPS, 2019). By 2024, MSMEs in Indonesia will show significant growth. Indonesia's MSMEs are estimated to reach more than 65 million business units, contributing 61% to the country's GDP, and comprising 97% of the national workforce (Indonesia, 2024).

In 2025, this sector is expected to have around 4.85 million businesses, experiencing significant growth of 21.13% compared to the previous year. This sector also absorbed more than 9.8 million workers, an increase of 20.48% compared to 2016. The sales value of the food and beverage sector in 2025 is expected to reach 998.37 trillion rupiah, an increase of 48.04% compared to the previous year. This sector growth continued in 2026, with the food and beverage industry recording a growth of 5.53% in the first quarter (BPS, 2024).

Although the food and beverage sector in Indonesia shows positive growth figures, there are still challenges that need to be overcome, such as the lack of understanding and adoption of digital technology and social media, which can be important tools to increase customer engagement and expand (Ali, 2018). Therefore, improving Entrepreneurial Orientation (EO), as well as optimizing the use of technology and social media, is key to boosting the competitiveness of MSMEs in the food and beverage sector in Indonesia in the digital era and Industry 5.0. Although the food and beverage industry has faced some declines, overall the sector has shown recovery with positive growth, especially in recent years. The resilience of this industry indicates that despite facing challenges, the sector still shows positive growth potential, likely driven by increasing demand and the role of technology and innovation in production and distribution processes (Fu, Silalahi, Yang, & Eunike, 2024).

However, despite the high growth potential of the food and beverage MSME sector, many face challenges in developing Competitive Advantage (CA). One major challenge is the lack of adoption of technology and the use of social media as a tool to increase competitiveness (Valdez, Luis, & Castillo, 2021). This is exacerbated by low awareness of the importance of an entrepreneurial orientation that leads to innovation and the ability to adapt to rapid market changes, particularly in Industry 5.0.

The study of Entrepreneurial Orientation (EO) and Competitive Advantage (CA) has been a frequently discussed topic in management literature. Many studies have shown that EO plays a crucial role in creating competitive advantage, emphasizing entrepreneurial attitudes such as innovation, risk-taking, and proactivity (Pozzo, Roa, Beleño, Orfale, Gomez, & Guerrero, 2023). However, the results found in previous studies regarding the direct relationship between EO and CA were not always consistent. Research conducted by (Monferrer, Moliner, Irún, & Estrada, 2021) indicates a weak relationship between the two. This inconsistency reflects the complexity in understanding how EO influences competitive advantage.

Previous research by Djiu, Kong, and Saputra (2024) shows that technological capabilities play a key role in enhancing competitive advantage. Technological capabilities include the use of technology to support operational efficiency, design new products, and accelerate response to market demand. Thus, technological capabilities can serve as a mediating variable that strengthens the influence of EO on competitive advantage (Oktaviani, 2024). Companies with a high entrepreneurial orientation will be more likely to adopt new technologies that enable them to develop innovative products and increase competitiveness (Mugoni, Nyagadza, & Hove, 2023).

In addition, the role of social media engagement is increasingly recognized in the literature as an important factor influencing competitive advantage, especially in today's digital era (Drummond & McGrath, 2018). Social media engagement refers to the interactions a company has with customers

through social media platforms, which can increase customer loyalty, expand market reach, and strengthen the brand. Research by Chen and Liu (2023) show that social media can be an effective medium for engaging more intensely with customers and supporting competitive advantage. Therefore, social media engagement can serve as a mediator connecting EO with increased competitive advantage, especially in sectors that rely heavily on relationships with consumers (Meier & Peters, 2023).

The novelty of this research lies in the development of a conceptual model that simultaneously integrates Entrepreneurial Orientation (EO), technological capabilities, and social media engagement within the Industry 5.0 framework, specifically for MSMEs in the food and beverage sector in Indonesia. Unlike previous studies that generally examine the relationship between EO and competitive advantage directly or using only one mediating variable, this study proposes a more comprehensive approach by involving two mediating variables simultaneously, namely technological capabilities and social media engagement, to explain the mechanism of competitive advantage formation in more depth. In addition, this study also provides a new contribution by examining this phenomenon in technology-based MSMEs adapting to the development of Industry 5.0, thus enriching the literature on strategic management and entrepreneurship and providing practical implications in encouraging digital transformation and increasing MSME competitiveness in the era of a technology-based economy.

2. Literature Review and Hypotheses Development

This study uses the grand theory of Theory This study uses a theory relevant to the relationship between entrepreneurial EO and competitive advantage, namely, the Resource-Based View (RBV). RBV argues that a company's competitive advantage can be obtained from internal resources (Degravel, 2012). Furthermore, this study attempts to integrate RBV with the dynamic capabilities theory explain the relationship between technological capabilities and social media engagement. This theory emphasizes an organization's capacity to combine, develop, and reorganize both internal and external resources to adapt to rapid environmental changes (Ferreira et al., 2020).

2.1 Competitive Advantage

Competitive Advantage is the company's ability to create superior value compared to competitors, either through lower costs, product differentiation, service quality, innovation, or the use of internal resources that are difficult to imitate (Farida & Setiawan, 2022). Porter explains that competitive advantage can be achieved when a company is able to manage its business activities more effectively to create value for customers, while Barney emphasizes that sustainable competitive advantage comes from the company's resources and capabilities that are valuable, rare, difficult to imitate, and difficult to substitute (Zahara et al., 2024). In this study, Competitive Advantage reflects a company's ability to maintain its market position, increase competitiveness, and produce better performance through the management of internal capabilities and appropriate strategies (Oktaviani et al., 2025).

2.2 Entrepreneurial Orientation

Entrepreneurial orientation is a company's strategic tendency to conduct business activities innovatively, proactively, and risk-taking to address market changes and create new opportunities. Companies with an entrepreneurial orientation are characterized by the ability to innovate, courage to make risky decisions, and proactive attitude in facing competition (Jallad & Karadas, 2024). Entrepreneurial orientation reflects the processes, practices, and decision-making styles that encourage companies to act competitively and adaptively (Munawar, 2025). In this study, entrepreneurial orientation plays a crucial role as a driving force for increased technological capabilities, social media engagement, and a company's competitive advantage.

2.3 Technological Capabilities

Technological capabilities are a company's ability to acquire, develop, integrate, and utilize technology to support operational activities, innovation, and business value creation. This capability includes a company's ability to use digital systems, manage information, adopt new technologies, improve process efficiency, and respond more quickly to market changes. Technological capability is

an important part of a company's dynamic capabilities because it helps organizations adapt to changes in the business environment (Demarchi, Bonello, Francalanza, & Rauch, 2024). In addition, Finnbogason and Melin (2014) explain that a company's ability to absorb and utilize technological knowledge can increase innovation and competitiveness. In this study, Technological Capabilities act as a factor that can strengthen the relationship between entrepreneurial orientation and competitive advantage, because companies with an entrepreneurial orientation tend to be better able to utilize technology to create innovation, efficiency, and competitive advantage (Oktaviani, 2025).

2.4 Social Media Engagement

Social media engagement is the level of customer or audience engagement, interaction, and participation in a company's activities through social-media platforms. This engagement can be seen in consumer responses such as liking, commenting, sharing content, providing reviews, following brand information, and actively communicating with the company (Amegbe, Zungu, & Asamoah, 2023). Amegbe et al. (2023) explains that engagement in social media includes cognitive, emotional, and behavioral activities of consumers towards brands, while Brodie et al. emphasize that consumer involvement in online communities can strengthen the relationship between customers and brands. In this study, social-media engagement plays an important role because the higher the company's interaction with customers through social media, the greater the company's opportunity to increase brand awareness, customer loyalty, trust, and competitive advantage (Malesev & Cherry, 2021).

2.5 Influence of Entrepreneurial Orientation

Entrepreneurial Orientation (EO) is an entrepreneurial attitude and behavior that encourages innovation, risk taking, and proactivity in managing a business (Mack, Marie-Pierre, & Redican, 2017). EO is believed to be an important factor influencing a company's ability to adapt to market changes and create value that differentiates it from competitors. Research by (Pozzo, Roa, Beleño, Orfale, Gomez, & Guerrero, 2023) shows that companies with a high entrepreneurial orientation tend to be more innovative, responsive to market changes, and have stronger competitiveness because they are able to manage resources better.

Technological capabilities refer to a company's ability to adopt and manage technology to improve operational efficiency and create innovative products or services (Valdez, Luis, & Castillo, 2021). Study by Mugoni, Nyagadza, and Hove (2023) found that a strong entrepreneurial orientation encourages firms to adopt new technologies more quickly, which in turn improves their ability to innovate and compete in the market. This is relevant to the Dynamic Capabilities Theory, which posits that the ability to manage and utilize technology is key to adapting to market changes and maintaining a long-term competitive advantage (Ferreira, Coelho, & Moutinho, 2020).

In addition, social media engagement reflects a company's interaction and involvement with customers through social media platforms (Matosas-López, 2024). In the digital era, social media has become an important tool for building stronger relationships with customers and increasing brand awareness. Research by Chen and Liu (2023) found that companies with a high entrepreneurial orientation tend to be more active in utilizing social media to increase customer engagement, expand market reach, and strengthen brands. Therefore, the integration of EO and effective use of social media can strengthen a company's position in a competitive industry.

H_1: Entrepreneurial orientation positively affects competitive advantage

H_2: Entrepreneurial orientation positively affects technological capabilities

H_3: Entrepreneurial orientation positively affects social media engagement

2.6 Influence of Technological Capabilities

Technological capabilities refer to a company's capacity to adopt, manage, and integrate technology into its business processes, in terms of operations, product innovation, and services (Wang & Zhang, 2024). Previous research has shown that technological capabilities play a crucial role in creating competitive advantages by enabling companies to operate more efficiently, introduce new products,

and adapt quickly to market changes and customer needs. Ciampi, Demi, Magrini, Marzi, and Papa (2021) found that companies with better technological capabilities tend to have an advantage in facing dynamic market challenges and can create more innovative products or services, thereby increasing competitiveness.

Furthermore, technological capabilities act as a bridge between the influence of entrepreneurial orientation and a company's competitiveness. Entrepreneurial orientation encourages companies to take risks, innovate, and be proactive in responding to market changes, while technological capabilities provide the tools and infrastructure necessary to translate these entrepreneurial ideas into valuable products or services (Kusa, Suder, & Duda, 2024). Research by (Valdez, Luis, & Castillo, 2021) revealed that companies with a high entrepreneurial orientation are more likely to invest in technology, which enables them to generate innovations that differentiate them from competitors and strengthen their competitive advantage.

H_4: Technological capabilities positively affect competitive advantage

H_6: Technological capabilities mediate the influence of entrepreneurial orientation on competitive advantage

2.7 Social Influence Media Engagement

Social media engagement refers to the interactions that occur between companies and customers through social media platforms, including communication, feedback, and long-term relationships with consumers (Meier & Peters, 2023). Previous research has shown that high engagement with customers through social media can increase brand awareness, strengthen customer loyalty, and expand market reach, all of which contribute to a company's competitive advantage (Matosas-López, 2024). A study by Martín-Rojas, Garrido-Moreno, and García-Morales (2023) showed that companies that actively interact with customers through social media can create stronger and more personal relationships, which improves the customer experience and, in turn, strengthens their competitive position.

In addition, entrepreneurial orientation, which emphasizes innovation, proactivity, and risk-taking, encourages companies to seek new ways of interacting with consumers and utilizing digital platforms to build stronger relationships with them (Drummond & McGrath, 2023). Research from David and Monreal (2025) shows that companies with a high entrepreneurial orientation are more likely to use social media as a strategic tool to interact with customers and introduce new products. Social media engagement acts as a bridge that allows companies to implement their innovations and entrepreneurial strategies directly with consumers through digital platforms, which in turn increases competitive advantage.

H_5: Social media engagement positively affects competitive advantage

H_7: Social media engagement mediates the influence of entrepreneurial orientation on competitive advantage

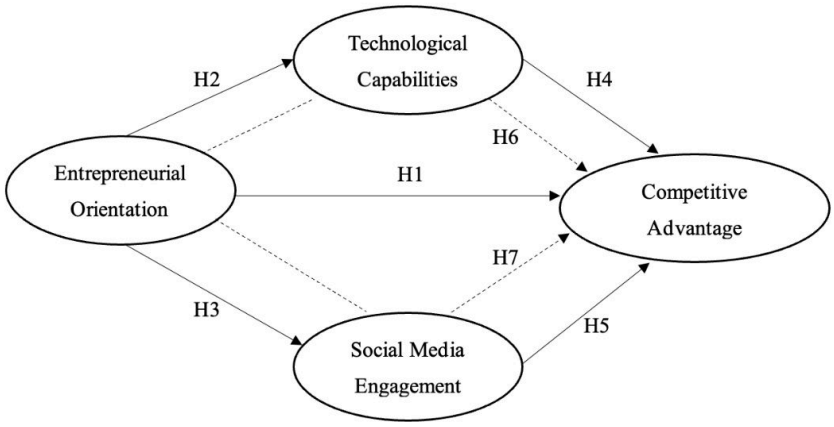


Figure 1. Research model

Based on Figure 1, the research model above was developed to explain how entrepreneurial orientation plays a role in increasing competitive advantage, both directly and indirectly. Directly, entrepreneurial orientation demonstrated through innovation, risk-taking courage, and proactivity is assumed to drive a company's competitive advantage. In addition, entrepreneurial orientation is predicted to influence technological capabilities and social media engagement because entrepreneurially oriented companies tend to be more active in adopting technology and utilizing social media to build relationships with customers and markets. Furthermore, technological capabilities and social media engagement are assumed to influence competitive advantage because technological capabilities can increase efficiency, innovation, and market response, while social media engagement can strengthen communication, brand image, and closeness with consumers. Thus, this model also places technological capabilities and social media engagement as mediating variables that explain how entrepreneurial orientation can strengthen competitive advantage through the use of technology and digital interaction with the market.

3. Research Methodology

The research approach used is deductive, starting with existing theories or models, namely the Resource-Based View (RBV) and Dynamic Capabilities Theory. Hypotheses are then formulated based on these theories. Data are then collected to test whether these hypotheses are supported by empirical evidence. In this deductive approach, researchers use theory to guide the data collection and analysis process and draw conclusions that can be tested statistically..

The study population comprised all food and beverage MSMEs in Tangerang City and South Tangerang that implemented Industry 5.0 technology in their business processes. The criteria for MSMEs included in this population are business actors that utilize technology in their operations, such as automation systems, digital platforms, and social media to support marketing and customer interactions. Because the exact population size is unknown, the sample in this study was selected using a purposive sampling technique, which selects sample elements based on certain criteria that align with the research objectives of this study. The research sample consisted of MSME owners and managers involved in business decision-making. Determining the sample size in this study refers to the general rule that the minimum sample size is five to ten times the number of indicators or question items. Because this study used 19 question items, the ideal sample size was 19 × 10 = 190 respondents. Therefore, this study set a minimum sample size of 190 respondents to ensure more representative and reliable analysis. The collected data will be analyzed using Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) with the help of SmartPLS (Oktaviani et al., 2025).

The outer model evaluation aimed to test the validity and reliability of the research instrument. Convergent validity was tested by examining the outer loading value (>0.70) and Average Variance Extracted (AVE) value (>0.50). Discriminant validity was tested using the Fornell–Larcker criteria

and Heterotrait–Monotrait Ratio (HTMT) (<0.90). Furthermore, construct reliability was measured using Composite Reliability and Cronbach's alpha values (>0.70) to ensure the internal consistency of the indicators in measuring the latent variables. The inner model evaluation aimed to examine the relationships between latent variables in the research model. This test was performed by examining the R-square (R^2) value to determine the ability of the independent variables to explain the dependent variable, and the adjusted R-square value to correct for model complexity. Additionally, an effect size (f^2) test was performed to determine the contribution of each exogenous variable to the endogenous variable.

Hypotheses testing was conducted using the bootstrapping method in SmartPLS with a specific number of resamplings (5,000 subsamples) to obtain t-statistics and p-values. The hypothesis was declared significant if the t-statistics value was > 1.96 and the p-value was < 0.05. To test the mediation effect of knowledge management, a specific indirect effect approach was used, where the significance of the indirect path was analyzed to determine whether full or partial mediation occurred.

4. Results and Discussions

4.1 Research Results

Based on Table 1, the respondents identity, seen from gender characteristics, was dominated by 112 men (59 %), while the number of female respondents was 78 (41 %). Based on age, the majority of respondents were in the age range of 25 to less than 35 years, as many as 83 people (44%), followed by 35 years to less than 45 years as many as 52 people (27%), age over 45 years old as many as 34 people (18%), and less than 25 years old as many as 21 people (11%). Meanwhile, based on length of service, most respondents had work experience.1 year to less than 3 years as many as 76 people (40%), then more than 6 years as many as 55 people (29%), 3 years to less than 6 years as many as 40 people (21%), and less than 1 year as many as 19 people (10%). Thus, the respondents in this study were predominantly male MSMEs, of productive age, and with sufficient work experience in running and making business decisions.

Table 1. Respondent Identity

	Amount	**Percentage(%)**
Gender		
Woman	78	41
Man	112	59
Age		
< 25 years	21	11
25 years - < 35 years	83	44
35 years - < 45 years	52	27
> 45 years	34	18
Length of work		
< 1 year	19	10
1 year - < 3 years	76	40
3 years - < 6 years	40	21
> 6 years	55	29

Based on Table 2, Outer Loading, all statement items in each variable had outer loading values above 0.70; therefore, it can be stated that all indicators meet the criteria for convergent validity and are suitable for use in further analysis. In the Entrepreneurial Orientation (EO) variable, the outer loading value ranges from 0.722 to 0.932, which indicates that indicators regarding the search for new opportunities, risk taking, innovation, and adaptation to technology are able to represent the EO variable well. The Technological Capabilities variable has an outer loading value between 0.797 and 0.900; therefore, indicators related to technological infrastructure, adoption of the latest technology, system management, and the use of digital tools are considered valid in measuring the company's

technological capabilities. Furthermore, the Social Media Engagement variable obtained an outer loading value between 0.753 and 0.879, which means that indicators regarding customer interaction, social media responses, active promotions, customer engagement, and digital community building are able to adequately explain the variable. Meanwhile, the Competitive Advantage variable showed a strong outer loading value, ranging from 0.843 to 0.908, indicating that indicators related to product quality, competitive pricing, customer service, customer satisfaction, and positive customer experiences can be declared valid in measuring competitive advantage. Thus, all items in this study have a good contribution to their respective constructs and can be used for the next stage of model testing.

Table 2. Measurement models and outer loading

Variables	Statement Items (Likert 1-5)	Outer Loading
Entrepreneurial Orientation (EO) (Hanaysha & Al-Shaikh, 2024)	1. Our company is always looking for new ways to introduce new products and services.	0.764
	2. We always take the initiative to seize new opportunities in the market without waiting for competition.	0.862
	3. Our company is ready to take risks to develop new products and services.	0.906
	4. We adapt to technological changes in a rapidly changing market.	0.932
	5. We actively seek new market opportunities to grow our business.	0.722
Technological Capabilities (Valdez-Juárez & Castillo-Vergara, 2021)	1. We have an adequate technological infrastructure to support company operations.	0.797
	2. Our company regularly adopts the latest technologies to support product innovation.	0.820
	3. We have a good system for managing and maintaining the technology we use.	0.900
	4. We use digital tools, such as management software, to improve operational efficiency.	0.881
Social Media Engagement (Matosas-López, 2024)	1. Companies often interact directly with customers through social media.	0.796
	2. We respond quickly to customer questions and feedback on social media.	0.879
	3. We utilize social media to actively promote our products and services.	0.877
	4. We invite customers to share their experiences with our products through social media.	0.753
	5. We strive to build an active customer community on social media to increase brand loyalty.	0.813
Competitive Advantage (Cadden, Weerawardena, Cao, Duan, & McIvor, 2023)	1. Our products have quality features that differentiate them from other competing products.	0.886
	2. We offer competitive prices compared to those of our competitors in the market.	0.884
	3. Our customer service is faster and more responsive than that of our competitors.	0.908
	4. Our customers are satisfied with the quality of our products and services.	0.902
	5. Our customers have a positive experience interacting with our business.	0.843

Based on Table 3, Construct Reliability and Validity Test, all variables in this study met the criteria for construct reliability and validity. The Cronbach's alpha value for each variable was above 0.70, namely, Competitive Advantage at 0.930, Entrepreneurial Orientation at 0.893, Social Media Engagement at 0.883, and Technological Capabilities at 0.872, indicating good internal consistency. In addition, the composite reliability value was above 0.70, with the highest value for Competitive Advantage at 0.947 and other values in the range of 0.913 to 0.923, which indicates that the indicators in each variable have strong reliability in measuring the construct. Furthermore, the Average Variance Extracted (AVE) values for all variables also exceeded the minimum threshold of 0.50, namely, Competitive Advantage at 0.783, Entrepreneurial Orientation at 0.708, Social Media Engagement at 0.681, and Technological Capabilities at 0.723. This indicates that each construct is able to explain more than 50% of the variance in its indicators. Thus, all variables in this study are declared reliable and valid, making them suitable for use in the next stage of the structural model testing.

Table 3. Construct reliability and validity test

	Cronbach alpha	**Composite reliability**	**Average variance extracted**
Competitive Advantage	0.930	0.947	0.783
Entrepreneur Orientation	0.893	0.923	0.708
Social Media Engagement	0.883	0.914	0.681
Technological Capabilities	0.872	0.913	0.723

Based on Table 4 of the Discriminant Validity Test, the test results using the Heterotrait-Monotrait Ratio (HTMT) value show that most of the relationships between variables have quite high values. In general, discriminant validity is declared good if the HTMT value is below 0.90. In the table, the relationship between Technological Capabilities and Competitive Advantage has a value of 0.889; therefore, it still meets the criteria for discriminant validity. However, several relationships between variables have values above 0.90, namely, Entrepreneurial Orientation with Competitive Advantage of 0.968, Social Media Engagement with Competitive Advantage of 0.943, Social Media Engagement with Entrepreneurial Orientation of 1.029, Technological Capabilities with Entrepreneurial Orientation of 0.956, and Technological Capabilities with Social Media Engagement of 0.971. These values indicate that several constructs in the model have very strong relationships and are not yet fully conceptually distinct from one another. Therefore, discriminant validity in this model has not been fully met, requiring further evaluation of the statement items, such as examining cross-loading values, removing indicators that are too similar, or reviewing the conceptual fit between variables so that each construct can truly measure different aspects.

Table 4. Discriminant validity test

	Heterotrait-monotrait ratio (HTMT)
Entrepreneur Orientation ↔ Competitive Advantage	0.968
Social Media Engagement ↔ Competitive Advantage	0.943
Social Media Engagement ↔ Entrepreneur Orientation	1,029
Technological Capabilities ↔ Competitive Advantage	0.889
Technological Capabilities ↔ Entrepreneur Orientation	0.956
Technological Capabilities ↔ Social Media Engagement	0.971

Based on Table 5, the adjusted R-square value shows the ability of the independent variables to explain the dependent variables in the research model. The Competitive Advantage variable has an adjusted R-square value of 0.774, which means that 77.4% of the variation in Competitive Advantage can be explained by variables in the model, such as Entrepreneurial Orientation, Technological Capabilities, and Social Media Engagement, while the remaining 22.6% is explained by other factors outside the research model. Furthermore, the Social Media Engagement variable has an adjusted

R-square value of 0.835, meaning that 83.5% of the variation in Social Media Engagement can be explained by the variables that influence it in the model, namely Entrepreneurial Orientation, while the remaining 16.5% is influenced by other factors. Meanwhile, the Technological Capabilities variable has an adjusted R-square value of 0.716, which shows that 71.6% of the variation in Technological Capabilities can be explained by Entrepreneurial Orientation, while the remaining 28.4% is influenced by other variables outside the research. Thus, all adjusted R-square values in this study are classified as strong, indicating that the model has good explanatory power for the endogenous variables tested.

Table 5. R square

	R-square adjusted
Competitive Advantage	0.774
Social Media Engagement	0.835
Technological Capabilities	0.716

Based on Table 6, the f-square value is used to determine the magnitude of the influence of each independent variable on the dependent variable in the research model. In general, an f-square value of 0.02 indicates a small influence, 0.15 indicates a moderate influence, and 0.35 indicates a large influence. The results in the table show that entrepreneurial orientation has a very large influence on social media engagement (value = 5.109) and a very large influence on technological capabilities (value = 2.536). This means that the company's entrepreneurial orientation plays a significant role in encouraging the use of social media and the development of technological capabilities. Furthermore, social media engagement has a large influence on competitive advantage (value = 0.580), indicating that company engagement with customers through social media can increase competitive advantage. Meanwhile, technological capabilities have a small influence on competitive advantage (value = 0.062), indicating that technological capabilities still contribute to competitive advantage, but the influence is not as large as social media engagement. Thus, the variable that has the strongest contribution in this model is entrepreneurial orientation towards social media engagement and technological capabilities, while the influence on competitive advantage is more dominantly explained through social media engagement.

Table 6. F square

	Competitive Advantage	**Social Media Engagement**	**Technological Capabilities**
Entrepreneur Orientation		5.109	2.536
Social Media Engagement	0.580		
Technological Capabilities	0.062		

Based on Table 7, the test results show that most of the hypotheses in this study are accepted because they have T-statistics values > 1.96 and P-values < 0.05. Hypothesis H_1 is accepted, which means that entrepreneurial orientation has a significant effect on competitive advantage, with a T-statistics value of 4.733 and P-values 0.000. Furthermore, H_2 is also accepted because entrepreneurial orientation has a significant effect on technological capabilities, with a T-statistics value of 31.956 and P-values 0.000. H_3 is accepted with a T-statistics value of 51.068 and P-values 0.000, thus indicating that entrepreneurial orientation has a significant effect on social media engagement. However, H_4 is rejected because the influence of technological capabilities on competitive advantage has a T-statistics value of 1.102 and P-values 0.270, thus it does not meet the significance criteria. Meanwhile, H_5 is accepted, which shows that social media engagement has a significant effect on competitive advantage with a T-statistic value of 2.801 and P-values of 0.005. In the mediation test, H_6 is rejected because technological capabilities are not able to mediate the relationship between entrepreneurial orientation and competitive advantage, indicated by a T-statistic value of 1.108 and P-values of 0.268. On the other hand, H_7 is accepted because social media engagement is able to mediate the relationship between entrepreneurial orientation and competitive advantage with a T-statistic value of 2.749 and

P-values of 0.006. Thus, the results of this study indicate that entrepreneurial orientation can increase competitive advantage directly or indirectly through social media engagement, but not through technological capabilities.

Table 7. Hypotheses testing

	Standard deviation	T statistics	P values
Entrepreneur Orientation → Competitive Advantage	0.104	4.733	0.000
Entrepreneur Orientation → Technological Capabilities	0.026	31.956	0.000
Entrepreneur Orientation → Social Media Engagement	0.018	51.068	0.000
Technological Capabilities → Competitive Advantage	0.097	1.102	0.270
Social Media Engagement → Competitive Advantage	0.118	2.801	0.005
Entrepreneur Orientation → Technological Capabilities → Competitive Advantage	0.081	1.108	0.268
Entrepreneur Orientation→ Social Media Engagement → Competitive Advantage	0.110	2.749	0.006

The research model result is presented in Figure 2.

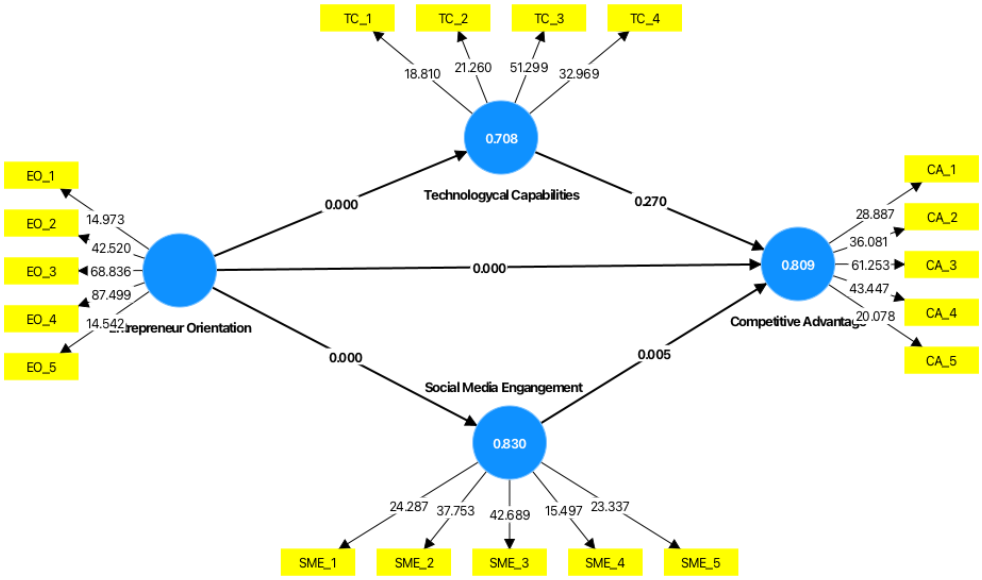


Figure 2. Research model results

4.2 Discussion

4.2.1 Entrepreneurial Orientationaffect to Competitive Advantage

The results of the study indicate that entrepreneurial orientation has a significant effect on competitive advantage; thus, the hypothesis of this study is accepted. This finding indicates that companies with a good entrepreneurial orientation tend to be more capable of creating competitive advantages through innovation, risk-taking, proactive attitudes, adaptability to market changes, and the search for new business opportunities (Arifin, Hadi, & Juliana, 2026). Companies with an entrepreneurial character respond more quickly to customer needs, develop differentiated products or services, and develop strategies that are superior to those of competitors. The results of this study align with research Mack, Marie-Pierre, and Redican (2017), which states that entrepreneurial orientation can encourage the formation of competitive advantage in MSMEs. In addition, this finding is also supported by Pozzo, Roa, Beleño, Orfale, Gomez, and Guerrero (2023), who explain that companies with a more entrepreneurial strategic posture tend to have better performance and competitive positions, especially in a competitive business environment. Thus, entrepreneurial orientation is a crucial factor in

strengthening competitive advantage because it can encourage companies to be more innovative, adaptive, and responsive to market opportunities.

4.2.2 Entrepreneurial Orientationaffect to Technological Capabilities

The results of the study indicate that entrepreneurial orientation has a significant effect on technological capabilities; thus, the hypothesis in this study is accepted. This finding indicates that companies with a strong entrepreneurial orientation tend to be more capable of developing and utilizing technology in their business activities. Entrepreneurial orientation, reflected through innovation, proactivity, courage to take risks, and the ability to see new opportunities, encourages companies to be more open to the use of digital technology, management systems, and modern operational tools. Entrepreneurial-oriented companies not only focus on routine business activities but also strive to find new ways to increase efficiency, accelerate work processes, and support product or service innovation through technology. The results of this study are in line with the view of (Valdez et al., 2021) that a company's ability to develop and integrate technological resources is part of its dynamic capabilities to respond to changes in the business environment. Thus, entrepreneurial orientation is a crucial factor driving companies to be more adaptive to technological developments and utilize them to support business growth

4.2.3 Entrepreneurial Orientationaffect to Social Media Engagement

The results of the study indicate that entrepreneurial orientation has a significant effect on social media engagement; thus, the hypothesis of this study is accepted. This finding indicates that companies with a strong entrepreneurial orientation tend to be more active in utilizing social media as a means of communication, promotion, and interaction with customers. Entrepreneurial orientation, reflected through innovation, proactivity, courage to take risks, and the ability to seek new opportunities, encourages companies to be more open to the use of digital platforms in building relationships with the market. Entrepreneurially oriented companies not only use social media as a marketing tool, but also as a medium to understand customer needs, respond to feedback, build communities, and create emotional closeness with consumers. The results of this study are in line with research by Chen and Liu (2023), who stated that entrepreneurial orientation can encourage social media adoption in MSMEs because innovative and proactive companies are more receptive to digital technology to support their business activities. Thus, entrepreneurial orientation is a crucial factor in increasing social media engagement because it can encourage companies to be more active, responsive, and creative in building relationships with customers through social media.

4.2.4 Technological Capabilities affect Competitive Advantage

The results of the study indicate that technological capabilities do not significantly influence competitive advantage, thus rejecting the hypothesis in this study. This finding suggests that ownership of technological infrastructure, use of digital tools, and the ability to manage technological systems do not necessarily create competitive advantage for a company. This may occur because technology is only a tool to support operations, while competitive advantage requires the use of technology integrated with business strategy, product innovation, service quality, and the company's ability to respond to market needs (Kusa, Suder, & Duda, 2024). In other words, the use of technology does not automatically result in competitive advantage if it is not optimally utilized to create differentiated value compared to competitors. This finding differs from the view Ciampi, Demi, Magrini, Marzi, and Papa (2021), which states that technological capabilities, as part of dynamic capabilities, can help companies adapt to environmental changes and increase competitiveness. However, this finding can be explained by the fact that in MSMEs, technology is often used only to support operational activities, not as a primary source of differentiation and competitive strategy. Therefore, technological capabilities need to be combined with entrepreneurial orientation, innovation, and customer engagement to make a stronger contribution to competitive advantage.

4.2.5 Social Media Engagement affects Competitive Advantage

The results of this study indicate that social media engagement has a significant effect on competitive advantage; thus, the hypothesis of this study is accepted. This finding indicates that companies' engagement with customers through social media plays a crucial role in creating competitive

advantage. Companies that actively interact with customers, respond to questions and feedback, promote products consistently, and build customer communities through social media will more easily increase closeness with consumers and strengthen brand image. Social media also allows companies to obtain market information more quickly, understand customer needs, and create a more personalized communication experience than competitors. The results of this study are in line with those (Meier & Peters, 2023), who state that the use of social media can increase customer interaction, brand visibility, and organizational performance. In addition, these findings also support (Martín-Rojas et al., 2023), who explain that customer engagement on social media can strengthen the relationship between customers and brands. Thus, social media engagement is a crucial factor in increasing competitive advantage because it can help companies build stronger customer relationships, increase loyalty, and create value that differentiates them from competitors.

4.2.6 Technological Capabilities Mediation in the Relationship Between Entrepreneurial Orientationon Competitive Advantage

The results of the study indicate that technological capabilities are unable to mediate the relationship between entrepreneurial orientation and competitive advantage; therefore, the hypothesis in this study is rejected. This finding indicates that although companies with an entrepreneurial orientation tend to be more open to the use and development of technology, these technological capabilities are not yet strong enough to be a pathway that explains the increase in competitive advantage (Oktaria et al., 2024). This can occur because technology in MSMEs is often used as an operational support tool, such as helping with record-keeping, communication, promotion, or work efficiency, but has not been fully integrated into a business strategy that can create product differentiation, improve service quality, or unique value for customers (Wang & Zhang, 2024). Thus, the use of technology does not automatically produce a competitive advantage if it is not accompanied by innovation, managerial capabilities, market understanding, and a clear value creation strategy. This finding differs from the view (Valdez et al., 2021), which states that technological capabilities, as part of dynamic capabilities, can support companies in responding to environmental changes and building competitive advantage. However, in this study, technological capabilities were not yet an effective mediating mechanism, so entrepreneurial orientation plays a more direct role or through other factors, such as social media engagement, in increasing competitive advantage.

4.2.7 Social Media Engagement Mediation in the Relationship Between Entrepreneurial Orientation on Competitive Advantage

The results of the study indicate that social media engagement can mediate the relationship between entrepreneurial orientation and competitive advantage; therefore, the hypothesis in this study is accepted. This finding indicates that companies with a strong entrepreneurial orientation can increase their competitive advantage directly and through active engagement in social media. Entrepreneurial orientation, reflected through innovation, proactivity, courage to take risks, and the ability to seek new opportunities, encourages companies to be more creative in utilizing social media as a means of building relationships with customers. Through social media engagement, companies can increase interaction with consumers, respond to market needs more quickly, strengthen brand image, and create closer and more personal communication with customers (Hasibuan et al., 2026). This involvement can ultimately help companies build loyalty, increase customer trust, and create value that differentiates them from competitors. The results of this study are in line with those (Drummond et al., 2023), who stated that the use of social media can increase customer interaction and support organizational performance. In addition, this finding supports that (David & Monreal, 2025), who explained that customer engagement in social media can strengthen the relationship between customers and brands. Thus, social media engagement becomes an important mechanism that bridges the influence of entrepreneurial orientation on competitive advantage, as social media can transform a company's entrepreneurial orientation into stronger customer relationships and a more tangible competitive advantage.

5. Conclusions

5.1 Conclusion

Based on all the research results, it can be concluded that entrepreneurial orientation is the main factor that drives increased company competitiveness because a strong entrepreneurial orientation can strengthen a company's ability to innovate, adapt, seize opportunities, and respond to market changes. The results show that entrepreneurial orientation influences competitive advantage, technological capabilities, and social media engagement, indicating that companies with an entrepreneurial character tend to be more active in developing technology and building digital interactions with customers. However, technological capabilities have not been able to provide a direct influence or mediate the relationship between entrepreneurial orientation and competitive advantage. This indicates that technology does not automatically become a source of competitive advantage when it is used only as an operational tool and is not fully integrated into business strategy, innovation processes, and value creation. In contrast, social media engagement has been proven to play a significant role in increasing competitive advantage and acts as an effective mediating mechanism because active engagement with customers through social media can strengthen relationships, loyalty, brand image, and values that differentiate the company from competitors. The main theoretical insight of this study is that technological capabilities and social media engagement have different roles in explaining competitive advantage. Technological capabilities function more as an internal supporting capability, while social media engagement acts as a market-facing mechanism that directly connects entrepreneurial behavior with customer value and competitive positioning. Thus, a company's competitive advantage is not only determined by the ownership or use of technology, but is more strongly influenced by how entrepreneurial orientation is translated into active, responsive, and valuable digital interaction strategies for customers.

5.2 Research Limitations

This study has several limitations that need to be considered. First, this study only focused on MSME owners or managers involved in business decision-making; thus, the results cannot necessarily be generalized to other types of organizations or larger companies. Second, this study used a cross-sectional approach, meaning that data collection was conducted at a specific point in time. Therefore, it is unable to explain long-term changes in Entrepreneurial Orientation, Technological Capabilities, Social Media Engagement, and Competitive Advantage. Third, the research data were obtained based on respondents' perceptions through a Likert-scale questionnaire, thus allowing for subjective bias in the responses. Fourth, this research model only examined Entrepreneurial Orientation, Technological Capabilities, and Social Media Engagement as factors influencing Competitive Advantage, while other factors such as innovation capability, market orientation, financial capability, leadership, organizational culture, and digital maturity were not included in the model. Furthermore, the results of discriminant validity indicate that several constructs have a very close relationship; therefore, further research needs to refine the measurement items to clarify the differences between variables. Therefore, it is recommended that future research expand the sample scope, use longitudinal data, add other relevant variables, and strengthen the measurement model so that the understanding of the factors that form Competitive Advantage becomes more comprehensive.

5.3 Suggestions and Directions for Future Research

Based on the limitations of this study, further research is recommended to expand the scope of respondents not only to MSME owners or managers, but also to other business sectors or larger-scale companies so that the results can be compared more broadly. Future research can also use a longitudinal approach to examine changes in the influence of entrepreneurial orientation, technological capabilities, social media engagement, and competitive advantage over a certain period. Furthermore, future researchers are advised to add other variables such as innovation capability, market orientation, digital maturity, leadership, financial capability, or customer relationship management to make the research model more comprehensive. Given that technological capabilities have not yet significantly influenced competitive advantage, future research can examine more deeply how technology is used strategically, not just as an operational tool. Furthermore, measurement items between variables need to be refined so that each construct has clearer conceptual differences, especially for variables that have very close relationships. Thus, further research is expected to

provide a deeper understanding of the factors that can strengthen a company's competitive advantage in the digital era.

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Author Contributions

HAN served as the lead researcher and was responsible for the conceptualization of the study, research design, supervision, data analysis, manuscript drafting and revision, and final approval of the manuscript. NAB contributed as a research member and was responsible for supporting data collection, literature review, data processing, manuscript preparation, revisions, and final approval of the manuscript. All authors have read and approved the final version of the manuscript and agree to be held accountable for all aspects of the work.

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