

## The Role of Sustainable Entrepreneurship, Organizational Resilience, and Management Practices in the Success of Women's MSMEs in the Digital Era

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### ABSTRACT

*This study examines the roles of sustainable entrepreneurship, organizational resilience, and management practices in the success of women-owned micro, small, and medium enterprises (MSMEs) in the digital era. Drawing on the Resource-Based View (RBV) and Dynamic Capabilities Theory, the study develops and tests a conceptual model that positions organizational resilience as a mediating variable, while management practices and digital transformation act as moderating variables.*

**Objectives:** *To analyze the effects of sustainable entrepreneurship and organizational resilience on the success of women-owned MSMEs and to test the moderating roles of management practices and digital transformation in these relationships.*

**Methodology:** *This study employed a quantitative approach with a correlational design. The sample consisted of 100 active women entrepreneurs in the MSME sector in Malang City and its surrounding areas, selected through purposive sampling. A five-point Likert-scale questionnaire was tested for construct validity using Confirmatory Factor Analysis and for reliability using Cronbach's alpha ( $\alpha \geq 0.70$ ). Data were analyzed using hierarchical multiple regression, classical assumption tests, mediation analysis, and moderation analysis.*

**Finding:** *Sustainable entrepreneurship ( $\beta = 0.65$ ;  $p < 0.001$ ) and organizational resilience ( $\beta = 0.72$ ;  $p < 0.001$ ) had positive and significant effects on business success. Organizational resilience partially mediated the relationship between sustainable entrepreneurship and business success. Management practices and digital transformation moderated these relationships by strengthening the positive effects of sustainability and resilience on business performance. The  $R^2$  value of 0.71 indicates that the model explained 71% of the variance in business success.*

**Conclusion:** *The integration of sustainable entrepreneurship and organizational resilience, supported by effective management practices and digital transformation adoption, represents a strategic pathway for improving the competitiveness and success of women-owned MSMEs. These findings extend Dynamic Capabilities Theory by demonstrating that sustainability and resilience capabilities function as mutually reinforcing dynamic resources.*

**Keywords:** *Sustainable Entrepreneurship Practices; Management Practices; Women Entrepreneurs; Micro, Small, and Medium Enterprises (MSMEs); Digital Transformation; Business Success.*

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## INTRODUCTION

Micro, small, and medium enterprises (MSMEs) play a strategic role in the Indonesian economy. As the backbone of the national economy, this sector absorbs a substantial workforce, particularly women, in both urban and rural areas. Women engaged in MSMEs serve not only as economic actors but also as agents of social development who contribute to family and community welfare (Adam et al., 2022). However, rapid developments in the digital era have created both new challenges and opportunities. Digital technologies such as e-commerce, social media, and financial technology platforms provide women entrepreneurs with broader market access. At the same time, intensified competition, rapid technological change, and unequal access to digital resources create significant structural barriers (Raman et al., 2022; Alhothali & Al-Dajani, 2022). This empirical phenomenon is reflected in data from the Ministry of Cooperatives and SMEs, indicating that although 64.5% of Indonesian MSME actors are women, their business sustainability rate remains lower than that of male-managed businesses, particularly during the digital expansion phase.

This disparity indicates a research gap that needs to be addressed. Most existing literature examines women's entrepreneurship and sustainable entrepreneurship separately, without empirically testing their interaction in the context of women-owned MSMEs in developing countries (Kabbara, 2023; Aman et al., 2022). In addition, the moderating roles of management practices and digital transformation in strengthening the relationships among sustainability, resilience, and business success have not been adequately explored.

This study addresses these gaps through three main contributions. First, theoretically, it integrates Dynamic Capabilities Theory and the Resource-Based View to develop a model explaining how sustainable entrepreneurship and organizational resilience interact to generate business success. Second, empirically, it tests a comprehensive moderated-mediation model (H1–H7) using primary data from 100 women MSME entrepreneurs. Third, practically, the findings provide evidence-based recommendations for women entrepreneurs and policymakers in designing capacity-building programs relevant to the digital context.

Accordingly, this study aims to: (1) analyze the effect of sustainable entrepreneurship on the success of women-owned MSMEs; (2) analyze the effect of organizational resilience on their success; (3) test the mediating role of organizational resilience in the relationship between sustainable entrepreneurship and business success; and (4) test the moderating roles of management practices and digital transformation in strengthening these relationships.

## LITERATURE REVIEW

### Theoretical Foundation

This study is grounded in two main theories. First, the Resource-Based View developed by Barney (1991) emphasizes that sustained competitive advantage originates from a firm's unique resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN). In the context of women-owned MSMEs, knowledge of sustainable practices, community social networks, and digital competencies are distinctive resources that can form the basis of competitive advantage (Adam et al., 2022).

Second, Dynamic Capabilities Theory (Teece et al., 1997; Teece, 2018) argues that, in turbulent environments, competitive advantage depends on an organization's ability to sense opportunities, seize opportunities, and reconfigure resources. This theory explains why organizational resilience is not merely a defensive capability but a dynamic capability that

enables proactive adaptation to disruption. Within this framework, digital transformation acts as an enabler that accelerates the sensing and seizing of market opportunities.

In addition to these core theories, this study draws on Stakeholder Theory (Freeman, 1984) to explain how sustainability practices enhance stakeholder legitimacy and trust, and Social Capital Theory (Putnam, 2000) to explain how social networks influence resource mobilization among women entrepreneurs.

### **Sustainable Entrepreneurship**

Sustainable entrepreneurship refers to entrepreneurial activities that balance economic viability, environmental stewardship, and social responsibility, commonly known as the triple-bottom-line approach (Cohen & Winn, 2007; Dean & McMullen, 2007). In MSMEs, this concept is manifested through efficient resource use, green innovation, and the creation of positive social impacts.

Kuckertz and Wagner (2010) found that sustainability orientation is positively associated with SME innovation capacity, which in turn improves business performance. In women-owned MSMEs, sustainable entrepreneurship is particularly relevant because many women-led businesses are rooted in local resources and intensive community interaction (Santoro et al., 2020). Therefore:

H1: Sustainable entrepreneurship has a positive and significant effect on the business success of women-owned MSMEs.

### **Organizational Resilience**

Organizational resilience is defined as a business's ability to anticipate, absorb, adapt to, and recover from internal and external shocks (Lengnick-Hall et al., 2011; Duchek, 2020). In women-owned MSMEs, this capability is particularly critical given limited access to capital, restricted business networks, and persistent technological gaps.

Cosentino and Paoloni (2021) showed that women's skills and leadership positively contribute to organizational resilience through the ability to build more inclusive stakeholder relationships. Furthermore, sustainable entrepreneurship is expected to strengthen resilience because businesses that use resources efficiently have greater reserve capacity to cope with external shocks (Birsan et al., 2022).

H2: Organizational resilience has a positive and significant effect on the business success of women-owned MSMEs.

H3: Sustainable entrepreneurship has a positive and significant effect on organizational resilience.

### **Management Practices as Moderators**

Effective management practices including strategic planning, resource allocation, human resource development, and performance monitoring are often overlooked in women's entrepreneurship research despite their significant impact on strategy implementation (Brush et al., 2019). Sound management practices can strengthen the positive effect of sustainable entrepreneurship by ensuring that sustainability principles are implemented consistently and measurably. Likewise, structured crisis-planning systems can enhance organizational resilience.

H4: Management practices moderate the relationship between sustainable entrepreneurship and the business success of women-owned MSMEs.

H5: Management practices moderate the relationship between organizational resilience and the business success of women-owned MSMEs.

### **Digital Transformation as a Moderator**

In the digital era, digital technology adoption not only improves operational efficiency but also expands market access and accelerates innovation processes (Baiyere et al., 2020; Nambisan, 2017). Teece (2018) argues that digitalization enhances sensing and seizing capabilities, which are central to Dynamic Capabilities Theory. In the sustainability context, digital platforms enable women entrepreneurs to optimize resource use through data analytics and technology-based monitoring systems.

H7: Digital transformation moderates the relationship between sustainable entrepreneurship and organizational resilience, such that the relationship is stronger at higher levels of digital adoption.

## **METHOD**

### **Research Design and Location**

This study used a quantitative approach with a correlational-causal design to analyze relationships and effects among the research variables. The study was conducted in Malang City and surrounding areas (Malang Regency and Batu City), East Java, selected because they have active and diverse MSME ecosystems with relatively high levels of digital adoption among women entrepreneurs.

### **Population and Sample**

The population comprised active women entrepreneurs in the MSME sector in the Greater Malang area. The sample consisted of 100 respondents selected through purposive sampling using the following criteria: (1) women managing their own businesses or serving as primary owners; (2) businesses operating for at least two years; and (3) businesses employing 1–50 employees, consistent with MSME criteria under Law No. 20 of 2008. This sample size meets the minimum requirements for multiple regression analysis with five predictors (a 1:20 ratio) and aligns with the recommendations of Hair et al. (2019) for multivariate analysis.

### **Instrument Development and Testing**

The research instrument was developed in three stages. First, a literature review was conducted to identify the dimensions and indicators of each variable. Second, discussions were held with three experts in the fields of MSME management and entrepreneurship for content validation. Third, pilot testing was carried out with 30 respondents outside the main sample to assess the instrument's readability and consistency.

The questionnaire used a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). Sustainable entrepreneurship was measured using 12 items covering sustainable resource use, green innovation, and social impact; organizational resilience used 10 items covering adaptability, crisis management, and operational flexibility; management practices used 8 items covering planning, resource allocation, HR development, and monitoring; digital transformation used 6 items covering e-commerce adoption, business social media use, and fintech utilization; and business success used 9 items covering revenue growth, customer growth, market expansion, and profitability.

### Validity and Reliability

Construct validity was assessed using Confirmatory Factor Analysis (CFA). The CFA results indicate that all items had factor loadings  $\geq 0.60$  and all constructs had an Average Variance Extracted (AVE)  $\geq 0.50$ , demonstrating good convergent validity. Discriminant validity was confirmed by comparing the square root of the AVE with inter-construct correlations (Fornell-Larcker criterion). Table 1 summarizes the validity and reliability test results.

Table 1. Construct Validity and Reliability Test Results

| Variabel                     | AVE  | CR   | Cronbach Alpha | Information      |
|------------------------------|------|------|----------------|------------------|
| Sustainable Entrepreneurship | 0,58 | 0,87 | 0,85           | Valid & Reliabel |
| Organizational Resilience    | 0,61 | 0,88 | 0,86           | Valid & Reliabel |
| Management Practices         | 0,55 | 0,83 | 0,81           | Valid & Reliabel |
| Digital Transformation       | 0,63 | 0,89 | 0,87           | Valid & Reliabel |
| Business Success             | 0,59 | 0,88 | 0,86           | Valid & Reliabel |

Source: Processed primary data (2024)

Reliability testing using Cronbach's alpha yielded values ranging from 0.81 to 0.87 for all constructs, exceeding the recommended minimum threshold of 0.70 (Hair et al., 2019). Composite Reliability (CR) values also exceeded 0.80, confirming good internal consistency.

### Data Analysis Techniques

Data analysis was conducted in several stages. First, descriptive statistics were used to describe respondent profiles and the distribution of variable scores. Second, classical assumption tests were performed, comprising: (a) a residual normality test using the Kolmogorov-Smirnov test, (b) a multicollinearity test using the Variance Inflation Factor (VIF  $< 10$ ), and (c) a heteroscedasticity test using the Glejser test. Third, hierarchical multiple regression analysis was employed to test H1 and H2. Fourth, a mediation test was conducted using the Baron-Kenny bootstrapping method with 5,000 resamples to test H6. Fifth, a moderation test was performed via interaction analysis (product-of-coefficients test) to test H4, H5, and H7.

## RESULTS AND DISCUSSION

### Profil Responden

Table 2 presents the demographic characteristics of the 100 female MSME entrepreneurs who participated in this study.

Table 2. Characteristics of Respondents

| Characteristic | Category        | Sum | Percentage (%) |
|----------------|-----------------|-----|----------------|
| Age            | 20–30 years old | 30  | 30             |
|                | 31–40 years old | 40  | 40             |
|                | 41–50 years old | 20  | 20             |
|                | > 50 years old  | 10  | 10             |

| Characteristic   | Category                     | Sum | Percentage (%) |
|------------------|------------------------------|-----|----------------|
| Education        | High School                  | 20  | 20             |
|                  | Diploma (D3)                 | 30  | 30             |
|                  | Bachelor (S1)                | 40  | 40             |
|                  | Postgraduate (Master's) (S2) | 10  | 10             |
| Type of Business | Culinary                     | 35  | 35             |
|                  | Craft                        | 30  | 30             |
|                  | Fashion                      | 20  | 20             |
|                  | Service                      | 15  | 15             |
| Lama Usaha       | 2–5 years old                | 42  | 42             |
|                  | 6–10 years old               | 38  | 38             |
|                  | > 10 years old               | 20  | 20             |

Source: Data is processed from the results of the 2024 research questionnaire.

The majority of respondents fall within the productive age group of 31–40 years (40%), a demographic generally possessing substantial work experience and a greater readiness to adopt digital technologies. The relatively high level of education—with 70% holding at least a diploma or bachelor's degree—indicates that the human capital within this sample is sufficient to support the implementation of structured management practices. The prevalence of culinary businesses (35%) aligns with the characteristics of women-led MSMEs in East Java, where local food products enjoy stable market demand and significant potential for digitalization via delivery platforms.

### Classical Assumption Test

The Kolmogorov-Smirnov normality test yielded a significance value of 0.142 ( $> 0.05$ ), indicating that the residuals are normally distributed. The multicollinearity test showed VIF values ranging from 1.42 to 2.18 well below the threshold of 10 indicating no serious multicollinearity issues. The Glejser test produced significance values greater than 0.05 for all predictors, confirming the absence of heteroscedasticity. The regression model satisfies all classical assumptions and is suitable for further analysis.

### Level of Implementation of Research Variables

Table 3 presents descriptive statistics for each research variable.

Table 3. Descriptive Statistics of Research Variables

| Variable                     | Indicator                        | Mean Score | Std. Dev. | Interpretation  |
|------------------------------|----------------------------------|------------|-----------|-----------------|
| Sustainable Entrepreneurship | Sustainable resource utilization | 4,20       | 0,58      | High            |
|                              | Green innovation                 | 3,90       | 0,72      | Moderately High |
|                              | Business social                  | 4,50       | 0,51      | Very High       |
|                              | Adaptability                     | 4,10       | 0,63      | High            |

| Variable                  | Indicator               | Mean Score | Std. Dev. | Interpretation  |
|---------------------------|-------------------------|------------|-----------|-----------------|
| Organizational Resilience | Crisis management       | 3,80       | 0,77      | Moderately High |
|                           | Operational flexibility | 4,30       | 0,55      | High            |
| Management Practices      | Strategic planning      | 3,95       | 0,68      | High            |
|                           | Performance monitoring  | 3,85       | 0,71      | Moderately High |
| Digital Transformation    | E-commerce adoption     | 4,20       | 0,62      | High            |
|                           | Fintech utilization     | 3,75       | 0,80      | Moderately High |

Source: The data was processed from the results of the 2024 research questionnaire

The highest score was recorded in the business social impact dimension (4.50), indicating that female MSME entrepreneurs possess a strong social orientation in their business operations. This aligns with literature showing that women tend to consider community impact an integral part of their business strategies (Brush et al., 2019). Conversely, the relatively lower scores for green innovation (3.90) and crisis management (3.80) highlight areas requiring improvement. The limitations in green innovation are likely attributable to restricted access to eco-friendly technologies and high implementation costs. Meanwhile, the lower crisis management score suggests a need to strengthen emergency response capabilities through training and the development of business contingency plans.

### Multiple Regression Analysis Results

Table 4 presents the results of the hierarchical multiple regression analysis used to test H1, H2, H4, H5, and H7. The models were constructed in three stages: Model 1 (control variables only), Model 2 (addition of main variables), and Model 3 (addition of moderating and interaction variables).

Table 4. Results of Hierarchical Multiple Regression Analysis

| Variable                          | Model 1 ( $\beta$ ) | Model 2 ( $\beta$ ) | Model 3 ( $\beta$ ) | Hypothesis Description |
|-----------------------------------|---------------------|---------------------|---------------------|------------------------|
| Sustainable Entrepreneurship (SE) | -                   | 0,65***             | 0,62***             | H1 Supported           |
| Organizational Resilience (OR)    | -                   | 0,72***             | 0,68***             | H2 Supported           |
| Management Practices (MP)         | -                   | 0,31**              | 0,29**              | -                      |
| Digital Transformation (DT)       | -                   | 0,28**              | 0,25**              | -                      |
| SE $\times$ MP (Interaction)      | -                   | -                   | 0,18*               | H4 Supported           |
| OR $\times$ MP (Interaction)      | -                   | -                   | 0,21*               | H5 Supported           |
| SE $\times$ DT (Interaction)      | -                   | -                   | 0,16*               | H7 Partially Supported |
| R <sup>2</sup>                    | 0,12                | 0,63                | 0,71                | -                      |
| $\Delta R^2$                      | -                   | 0,51***             | 0,08**              | -                      |
| F-statistic                       | 4,21**              | 28,47***            | 22,93***            | -                      |

Note: \*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05

Source: Processed primary data (2024)

The results of Model 2 indicate that sustainable entrepreneurship ( $\beta = 0.65$ ;  $p < 0.001$ ) and organizational resilience ( $\beta = 0.72$ ;  $p < 0.001$ ) have significant positive effects on business success, thereby supporting H1 and H2. The coefficient of determination ( $R^2 = 0.63$ ) indicates that these two main variables explain 63% of the variance in business success. The inclusion of moderating effects in Model 3 increased the  $R^2$  value to 0.71 ( $\Delta R^2 = 0.08$ ;  $p < 0.01$ ), indicating that management practices and digital transformation make a significant incremental contribution.

The interaction between Sustainable Entrepreneurship and Management Practices ( $SE \times MP$ ) ( $\beta = 0.18$ ;  $p < 0.05$ ) supports H4, indicating that the positive effect of sustainable entrepreneurship on business success becomes stronger at higher levels of management practices. Similarly, the interaction between Organizational Resilience and Management Practices ( $OR \times MP$ ) ( $\beta = 0.21$ ;  $p < 0.05$ ) supports H5, suggesting that effective management practices enhance the positive impact of organizational resilience on business success. Furthermore, the interaction between Sustainable Entrepreneurship and Digital Transformation ( $SE \times DT$ ) ( $\beta = 0.16$ ;  $p < 0.05$ ) provides partial support for H7, indicating that digital transformation strengthens the relationship between sustainable entrepreneurship and organizational resilience.

### Mediation Analysis (H3 and H6)

The mediation analysis was conducted using path analysis with a bootstrapping method involving 5,000 resamples to test H3 (the effect of Sustainable Entrepreneurship on Organizational Resilience) and H6 (the mediating role of Organizational Resilience in the relationship between Sustainable Entrepreneurship and business success). Table 5 presents the results of the mediation analysis.

Table 5. Mediation Analysis Results (Bootstrapping, 95% CI)

| Path                                                                    | Coefficient (b) | SE   | 95% CI Lower Bound | 95% CI Upper Bound | Description                      |
|-------------------------------------------------------------------------|-----------------|------|--------------------|--------------------|----------------------------------|
| KB $\rightarrow$ KO (H3)                                                | 0,58***         | 0,08 | 0,43               | 0,73               | H3 Supported                     |
| SE $\rightarrow$ Business Success (direct effect)                       | 0,41***         | 0,09 | 0,24               | 0,58               | Significant                      |
| SE $\rightarrow$ OR $\rightarrow$ Business Success (indirect effect/H6) | 0,32**          | 0,07 | 0,19               | 0,46               | H6 Supported (partial mediation) |

Note:\*\* \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; CI = Confidence Interval.

Source:\*\* Primary data processed (2024).

The bootstrapping results confirm H3: sustainable entrepreneurship has a positive effect on organizational resilience ( $b = 0.58$ ; 95% CI [0.43, 0.73]). This finding is consistent with the argument that businesses that use resources efficiently have greater reserve capacity to cope with external shocks.

For H6, the indirect effect of Sustainable Entrepreneurship  $\rightarrow$  Organizational Resilience  $\rightarrow$  Business Success was 0.32 (95% CI [0.19, 0.46]). Because the confidence interval does not include zero, the mediation effect is significant. Since the direct effect of sustainable entrepreneurship on business success also remained significant ( $b = 0.41$ ), the mediation is partial. This means that organizational resilience is an important, but not the only, mechanism through which sustainable entrepreneurship enhances business success.

### **Theoretical Discussion and Comparison with Previous Studies**

The findings of this study extend and reinforce several existing streams of literature. First, the positive effect of sustainable entrepreneurship on business success ( $\beta = 0.65$ ) is consistent with the findings of Kuckertz and Wagner (2010) in Europe and Raman et al. (2022) in the Asian context. However, the coefficient in this study is larger within the context of women-owned MSMEs in Indonesia. This finding can be explained through the Resource-Based View (RBV), whereby sustainability practices that remain relatively uncommon among Indonesian MSMEs become unique sources of competitive advantage that are difficult for competitors to imitate.

Second, the stronger effect of organizational resilience ( $\beta = 0.72$  compared with  $\beta = 0.65$  for sustainable entrepreneurship) confirms Ducheck's (2020) argument that adaptive capabilities have premium value in uncertain environments. Compared with the findings of Acevedo-Duque et al. (2021) in the Latin American context, the effect of resilience in this study is stronger. This may reflect the high level of uncertainty in the business environment faced by Indonesian MSMEs, which continue to encounter challenges related to digital infrastructure and post-pandemic economic fluctuations.

Third, the finding of partial mediation by organizational resilience provides a new theoretical contribution that has not been extensively examined in previous literature on women-owned MSMEs. Partial mediation indicates that sustainability affects business success through two pathways: a direct pathway, through improved reputation and customer loyalty, and an indirect pathway, through strengthened resilience capacity. This finding extends the model proposed by Lengnick-Hall et al. (2011) by demonstrating that sustainability is not only an outcome of resilience but also an antecedent that develops resilience capability itself.

Fourth, the significant moderating role of management practices (interaction  $\beta = 0.18$ – $0.21$ ) emphasizes the importance of structured management systems in optimizing sustainability and resilience strategies. This finding is consistent with Brush et al. (2019), who emphasized that access to management training is a critical distinguishing factor between successful women-owned MSMEs and those that fail to grow.

### **CONCLUSION**

This study provides comprehensive empirical evidence regarding the determinants of business success among women-owned MSMEs in the digital era. Overall, all proposed hypotheses (H1–H7) received empirical support from the data, and the model demonstrated good explanatory power ( $R^2 = 0.71$ ). The main conclusions of this study are as follows: (1) sustainable entrepreneurship and organizational resilience are the primary determinants of business success among women-owned MSMEs, with organizational resilience exerting a stronger effect; (2) organizational resilience partially mediates the relationship between sustainable entrepreneurship and business success, indicating that sustainability develops adaptive capacity, which in turn improves business performance; (3) effective management practices and the adoption of digital transformation significantly moderate and strengthen these relationships; and (4) green innovation and crisis management are the dimensions with the lowest scores, indicating priority areas for capacity development among women-owned MSMEs. Theoretically, this study contributes by integrating the Resource-Based View (RBV) and Dynamic Capabilities Theory into a comprehensive model. It also demonstrates that sustainability capability functions as an antecedent of resilience, rather than merely as a complementary factor, thereby extending the understanding of dynamic resources in the context

of women-owned MSMEs. From a managerial perspective, women MSME entrepreneurs are encouraged to prioritize the development of structured crisis-management systems, increase the adoption of digital platforms to expand market reach, and gradually integrate green innovation principles into their production processes. From a policy perspective, governments and MSME-support institutions need to design mentoring programs that include crisis-management training, facilitation of access to environmentally friendly technologies, and the enhancement of digital literacy among women entrepreneurs. The limitations of this study include: (1) the sample was limited to one region, namely Greater Malang, and therefore generalization to other contexts should be made with caution; (2) the cross-sectional design does not allow for strong causal inferences; and (3) self-reported data may be vulnerable to social desirability bias. Future research is recommended to employ longitudinal designs, expand the geographical scope, and incorporate objective business-performance data, such as actual financial records, to complement perceptual data.

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