

Dynamic Capabilities and Business Performance of Batik SMEs in Solo City: The Mediating Role of Organizational Resilience and the Moderating Effect of Omnichannel Business Model Innovation

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ABSTRACT

This research aims to analyze the influence of dynamic capabilities on the business performance of batik SMEs in the city of Solo, with organizational resilience as a mediating variable and omnichannel business model innovation as a moderating variable. A quantitative approach was used with a survey method involving 120 batik SMEs. Data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS). The results show that dynamic capabilities have a positive and significant effect on organizational resilience, which in turn positively affects business performance. However, dynamic capabilities do not have a direct effect on business performance. These findings indicate that organizational resilience fully mediates the relationship between dynamic capabilities and business performance. In addition, omnichannel business model innovation strengthens the influence of organizational resilience on business performance. These results confirm the importance of strategic capabilities, organizational resilience, and integration of business channels in improving the performance of batik SMEs in a dynamic business environment.

KEYWORDS *dynamic capabilities, organizational resilience, omnichannel innovation, business performance, batik SMEs*



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INTRODUCTION

The batik industry is one of the leading sectors in Indonesia's creative economy, particularly in the city of Solo (Surakarta), which has long been known as the center of national batik. Batik SMEs in this region contribute significantly to job creation, local economic growth, and the preservation of cultural heritage (Ministry of Tourism and Creative Economy, 2022; Tambunan, 2019). However, batik SMEs also face significant challenges due to digitalization, changing consumer preferences, and increasing competition from modern textile products (Rahayu & Day, 2017).

From a strategic management perspective, an organization's ability to survive and thrive largely depends on its adaptive capabilities in responding to environmental changes (Hansson & Abrantes, 2023; Hokmabadi et al., 2024; Jiang et al., 2019; Lengnick-Hall & Beck, 2016; Miceli et al., 2021). The concept of dynamic capabilities explains how companies can sense, seize, and transform resources and strategies in a sustainable manner. For batik SMEs, this capability is reflected in their ability to read market trends, innovate motifs, and adopt digital marketing strategies.

However, possessing dynamic capabilities does not automatically lead to higher business performance. SMEs tend to have limited resources and are more vulnerable to external shocks, so they need internal mechanisms that allow organizations to survive and recover from crises (Williams et al., 2017). In this context, organizational resilience is a key

concept that explains an organization's ability to absorb stress, adapt, and bounce back without losing its core function (Lengnick-Hall et al., 2011; Duchek, 2020).

Additionally, the development of digital technology encourages batik SMEs to use various marketing and distribution channels, such as physical stores, social media, and online marketplaces. However, most SMEs still manage these channels separately (multi-channel), rather than integrating them (omnichannel) (Verhoef et al., 2015). Omnichannel business model innovation, which emphasizes channel integration and a consistent customer experience, is seen as capable of strengthening the effectiveness of organizational resilience in improving business performance (Hübner et al., 2016; Cao & Li, 2015).

Despite the growing body of research on dynamic capabilities and business performance, most previous studies have focused on large firms or manufacturing industries (Chari et al., 2022; Fainshmidt et al., 2016). Empirical research examining the internal mechanisms that link dynamic capabilities to business performance in culture-based SMEs, such as the batik industry, remains limited. Furthermore, the role of organizational resilience as a mediating mechanism in the relationship between dynamic capabilities and SME performance has not been sufficiently explored, particularly within the context of creative industries facing digital transformation (Duchek, 2020; Williams et al., 2017).

Additionally, although digital channel adoption among SMEs has increased significantly, prior research often treats multi-channel and omnichannel approaches as similar concepts. In reality, omnichannel strategies require a higher level of strategic integration and involve fundamental changes in the firm's business model, organizational processes, and customer engagement strategies (Verhoef et al., 2015). Therefore, understanding how omnichannel business model innovation strengthens the relationship between organizational capabilities and business performance is becoming increasingly important.

Based on these research gaps, this study aims to analyze the influence of dynamic capabilities on the business performance of batik SMEs in Solo City Shofwani et al (2024), with organizational resilience acting as a mediating variable and omnichannel business model innovation functioning as a moderating variable (Andre & Raharjo, 2021; Poernomo et al., 2025). By integrating these three strategic perspectives into a single conceptual framework, this study seeks to explain how adaptive capabilities, organizational resilience, and channel integration collectively influence SME performance in a rapidly changing business environment (Omowole et al., 2024; Skouloudis et al., 2020).

Theoretically, this research contributes to the strategic management and SME literature by expanding the understanding of dynamic capabilities in the context of culture-based creative industries. Specifically, this study provides empirical evidence on the mediating role of organizational resilience in translating dynamic capabilities into business performance and highlights the moderating role of omnichannel business model innovation in strengthening this relationship.

Practically, the findings of this study are expected to provide valuable insights for batik SME owners and managers in developing strategies to enhance their competitiveness and sustainability. By strengthening dynamic capabilities, building organizational resilience, and adopting integrated omnichannel business models, batik SMEs can improve their adaptability and performance in an increasingly digital and competitive market environment. Furthermore, the results of this study may serve as a reference for policymakers and SME

support institutions in designing programs that encourage digital transformation, innovation capability development, and resilience building among SMEs in the creative economy sector.

METHOD

Research and Sample Design

This study uses a quantitative approach with survey design, which is commonly used in strategic management and SME research (Hair et al., 2022). The research population is batik SMEs in the city of Solo. A sample of 120 SMEs was obtained through *purposive sampling techniques*.

Variable Measurement and Data Analysis Techniques

All research variables were measured using a five-point Likert scale, ranging from strongly disagree to strongly agree.

Data analysis was carried out using *the Structural Equation Modeling–Partial Least SEM-PLS* method because this method is suitable for complex models and medium sample sizes (Hair et al., 2022; Sarstedt et al., 2017).

Research Model

Based on theoretical studies and hypothesis development, this study developed a strategic management-based research model that explains the relationship between dynamic capabilities, organizational resilience, omnichannel business model innovation, and the business performance of batik SMEs in the city of Solo.

This research model is built with reference to the perspective of dynamic capabilities theory, which states that an organization's adaptive capabilities do not directly result in superior performance. Instead, they work through internal mechanisms that allow organizations to survive and adapt to changes in the environment (Teece et al., 1997; Teece, 2007). In this context, organizational resilience is positioned as a mediating mechanism that bridges the influence of dynamic capabilities on business performance.

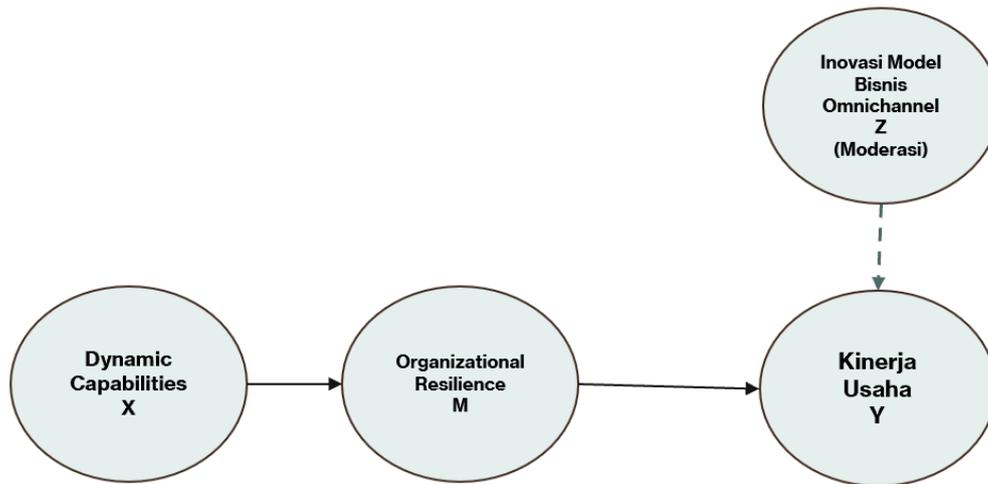
In addition, this study integrates the concept of omnichannel business model innovation as a contextual variable that strengthens the relationship between organizational resilience and business performance. Omnichannel innovation is viewed as a strategy that increases flexibility, channel integration, and the ability of SMEs to respond to market changes, thereby magnifying the strategic benefits of organizational resilience (Verhoef et al., 2015; Cao & Li, 2015).

Conceptually, this research model puts the following:

1. **Dynamic Capabilities (X)** as an independent variable that represents the adaptive ability of batik SMEs.
2. **Organizational Resilience (M)** as a mediating variable that explains the internal mechanism for business performance formation.
3. **Omnichannel (Z) Business Model Innovation** as a moderation variable that strengthens the influence of *organizational resilience* on business performance.
4. **Business Performance (Y)** as a dependent variable that reflects the achievement of batik SME business results.

The relationship between variables in this research model is described as follows:

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The model shows that dynamic capabilities affect business performance indirectly through organizational resilience. Furthermore, omnichannel business model innovation acts as a moderator, strengthening the influence of organizational resilience on business performance. Thus, the success of batik SMEs in improving business performance is highly dependent on the organization's ability to build internal resilience and strategically integrate business channels.

This research model serves as the basis for empirical testing using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) method to test the hypothetical causal relationships, mediating effects, and moderating effects.

Calculation and Testing Criteria for SEM-PLS

Since the method you are using is SEM-PLS, the "calculation formulas" commonly listed in the JAM article are formulas for latent constructs, reliability–validity, R^2 , f^2 , Q^2 , significance testing (bootstrapping), mediation, and moderation (interaction term). Below is a complete formula package that can be inserted in the Research Methods / Data Analysis Techniques section.

SEM-PLS Calculation Formula and Test Criteria

1) Measurement Model (Outer Model)

a) Latent Construct Score (Combination of Indicators)

The latent construct is formed from reflective indicators as a linear combination:

$$\eta = \sum_{i=1}^k w_i x_i$$

Remarks: η = latent construct score, x_i = i-i indicator, w_i = outer weight, k = number of indicators.

b) Cronbach's Alpha (α)

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum_{i=1}^k \sigma_i^2}{\sigma_T^2} \right)$$

Remarks:

k =number of indicators, σ_i^2 =variance of indicator i , σ_T^2 =variance of total scores.

General criteria: $\alpha \geq 0,70$

c) Composite Reliability (CR)

$$CR = \frac{(\sum_{i=1}^k \lambda_i)^2}{(\sum_{i=1}^k \lambda_i)^2 + \sum_{i=1}^k Var(\varepsilon_i)}$$

For standardized indicators:

$$Var(\varepsilon_i) = 1 - \lambda_i^2$$

General criteria: $CR \geq 0,70$

d) Average Variance Extracted (AVE)

$$AVE = \frac{\sum_{i=1}^k \lambda_i^2}{k}$$

General criteria: $AVE \geq 0,50$

e) Discriminant Validity (HTMT)

The HTMT ratio is calculated as:

$$HTMT_{ab} = \frac{\text{rata-rata korelasi heterotrait-heteromethod}}{\text{rata-rata korelasi monotrait-heteromethod}}$$

General criteria: (strict) or (loose). $HTMT < 0,85 < 0,90$

2) Model Struktural (Inner Model)

a) Structural Model Equation

Your research model can be written in two main equations:

(1) Mediation:

$$OR = \beta_1 DC + \zeta_1$$

(2) Influence to Performance (with moderation):

$$KU = \beta_2 OR + \beta_3 (OR \times OC) + \beta_4 DC + \zeta_2$$

Description: DC = Dynamic Capabilities, OR = Organizational Resilience, OC = Omnichannel Innovation, KU = Business Performance.

ζ_1, ζ_2 = error.

b) Coefficient of Determination (R^2)

$$R^2 = 1 - \frac{\sum(y - \hat{y})^2}{\sum(y - \bar{y})^2}$$

Interpretation criteria (common in PLS):

0.25 (weak), 0.50 (moderate), 0.75 (strong).

c) Effect Size (f^2)

To measure the contribution of each exogenous variable:

$$f^2 = \frac{R_{inklusi}^2 - R_{eksklusi}^2}{1 - R_{inklusi}^2}$$

Criteria: 0.02 (small), 0.15 (medium), 0.35 (large).

d) Predictive Relevance (Q^2 / Stone–Geisser)

With the blindfolding technique:

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$$Q^2 = 1 - \frac{\sum(y - \hat{y})^2}{\sum(y - \bar{y})^2}$$

Criteria: indicate the model has predictive relevance. $Q^2 > 0$

e) Collinearity (VIF)

$$VIF = \frac{1}{1 - R_j^2}$$

General criteria: (or more stringent). $VIF < 5 < 3,3$

3) Significance Test (Bootstrapping in PLS)

The path coefficient is tested for significance using the statistics t:

$$t = \frac{\beta}{SE(\beta)}$$

Two-tailed criteria:

- $p < 0.05$ significant $\rightarrow (\approx t > 1.96)$
- $p < 0.01$ \rightarrow very significant $(\approx t > 2.58)$

4) Mediation Test

Indirect effects:

$$\text{textIndirectEffect} = (\beta_{DCtoOR}) \times (\beta_{ORtoKU})$$

Mediation classification (general):

- **Full mediation** if the indirect effect is significant, but the direct effect is insignificant. $DCtoKU$
- **Partial mediation** if both are significant.

5) Moderation Test (Interaction Effect)

The interaction variables are formed as:

$$(OR \times OC)$$

Moderation equation (according to your model):

$$KU = \beta_2 OR + \beta_3 (OR \times OC) + \dots$$

Criteria: significant interaction coefficient ($p < 0.05$) means that there is moderation. β_3

Best practice: use **the product indicator approach** or **the two-stage approach** in SmartPLS, depending on the type of construct.

Model testing was carried out using SEM-PLS. The evaluation of the outer model includes internal reliability (Cronbach's Alpha, Composite Reliability), convergent validity (AVE), and discriminant validity (HTMT). The evaluation of the inner model included the determination coefficient (R^2), effect size (f^2), predictive relevance (Q^2), and multicollinearity test (VIF). The significance of the path coefficient, mediation effect, and moderation effect was tested using the bootstrapping procedure. The mediation effect was calculated as a product of the $DC \rightarrow OR$ and $OR \rightarrow KU$ pathway coefficients, while the moderation was tested through the interaction coefficient of $OR \times OC$ to KU .

RESULT AND DISCUSSION

The results of the analysis show that dynamic capabilities have a significant effect on organizational resilience, in line with previous research that emphasized the role of adaptive capabilities in building organizational resilience (Duchek, 2020; Williams et al., 2017). Furthermore, organizational resilience has been shown to have a positive effect on business performance, which supports the view that organizational resilience is an important prerequisite for the sustainability of SMEs (Lengnick-Hall et al., 2011).

In addition, omnichannel business model innovations strengthen the relationship between organizational resilience and business performance, showing that the integration of business channels can increase the strategic benefits of organizational resilience (Verhoef et al., 2015; Cao & Li, 2015).

Respondent Profile

Table 1. Respondent Criteria

Criteria	Percentage
Business age > 5 years	62%
Using an online marketplace	78%
Using social media	85%

Source: Processed research data (2026)

The results show that the majority of batik SMEs have been operating for more than five years (62%), indicating that most businesses already possess a relatively stable operational foundation and market experience. In addition, a significant proportion of SMEs have adopted digital platforms in their marketing activities. Approximately 78% of respondents use online marketplaces, while 85% utilize social media platforms to promote their products. This finding indicates that digital adoption among batik SMEs has grown considerably, although the level of strategic integration between channels may still vary. The increasing use of digital platforms reflects SMEs' efforts to expand market reach and adapt to the evolving digital economy.

Evaluation of Measurement Models

Table 2. Reliability and Validity of Constructs

Variabel	Cronbach's Alpha	CR	AVE
Dynamic Capabilities	0,87	0,91	0,63
Organizational Resilience	0,88	0,92	0,65
Inovasi Omnichannel	0,85	0,90	0,60
Business Performance	0,86	0,91	0,64

Source: SEM-PLS analysis results, processed research data (2026)

The entire construct meets the criteria of convergent reliability and validity. The results indicate that all constructs meet the recommended reliability criteria, as the Cronbach's Alpha and Composite Reliability values exceed the threshold of 0.70 (Hair et al., 2022). This

suggests that the indicators used in each construct are internally consistent and capable of reliably measuring the underlying latent variables.

Furthermore, the AVE values for all constructs are above the minimum threshold of 0.50, indicating adequate convergent validity. This means that the indicators explain more than half of the variance of their respective constructs. Therefore, the measurement model demonstrates acceptable levels of reliability and validity, allowing further evaluation of the structural model.

Structural Model Evaluation

Table 3. Path Coefficients

Hubungan	b	t-value	p-value
DC → KU	0,12	1,45	0,147
DC → OR	0,61	8,32	0,000
OR → KU	0,54	6,21	0,000
OR × OC → KU	0,23	2,87	0,004

Source: SEM-PLS bootstrapping results, processed research data (2026)

The results indicate that dynamic capabilities have a positive and significant effect on organizational resilience ($\beta = 0.61$; $p < 0.001$), suggesting that SMEs with stronger adaptive capabilities are better able to develop resilience in responding to environmental changes. These capabilities enable firms to identify opportunities, address challenges, and adjust their operational strategies more effectively. However, dynamic capabilities do not have a direct significant effect on business performance ($\beta = 0.12$; $p = 0.147$), indicating that adaptive capabilities alone are insufficient to directly generate superior business outcomes. Instead, these capabilities must be translated into internal organizational mechanisms that enhance the firm's ability to cope with uncertainty and disruption. Furthermore, organizational resilience is found to have a positive and significant effect on business performance ($\beta = 0.54$; $p < 0.001$), demonstrating that SMEs with stronger resilience are better able to maintain operational stability, adapt to environmental changes, and sustain their performance over time. In addition, the interaction between organizational resilience and omnichannel business model innovation shows a significant positive effect on business performance ($\beta = 0.23$; $p = 0.004$), confirming that the integration of multiple business channels strengthens the strategic impact of organizational resilience in improving business performance.

Table 4. Mediation Test

Jalur	Indirect Effects	t-value
DC → OR → KU	0,33	4,96

Source: SEM-PLS mediation analysis, processed research data (2026)

The results show that the indirect effect of dynamic capabilities on business performance through organizational resilience is significant ($t = 4.96$). Meanwhile, the direct effect of dynamic capabilities on business performance is not significant. This indicates the presence of **full mediation**, meaning that dynamic capabilities influence business performance indirectly through the formation of organizational resilience.

The results showed full mediation and a significant moderation effect. The finding that dynamic capabilities do not have a direct effect on business performance shows that adaptive capabilities alone are not enough to improve the performance of batik SMEs. This result is in line with the view that strategic capabilities need to be internalized and operationalized through certain organizational mechanisms in order to generate economic value.

The role of organizational resilience as a full mediator indicates that the ability of batik SMEs to survive, adapt, and recover from pressure is the main prerequisite for the achievement of business performance. In other words, dynamic capabilities contribute to business performance through the formation of organizational resilience that enables SMEs to respond to environmental changes more effectively and sustainably (Duchek, 2020).

In addition, the results of the moderation test show that omnichannel business model innovation strengthens the influence of organizational resilience on business performance. These findings confirm that business channel integration not only serves as a marketing tool, but also as a risk mitigation strategy and increased business flexibility. Batik SMEs that are able to strategically integrate offline and online channels benefit from organizational resilience in improving business performance (Verhoef et al., 2015; Cao & Li, 2015).

CONCLUSION

This study concludes that dynamic capabilities do not directly improve the performance of batik SMEs in Solo City, but instead work through organizational resilience as the main mediation mechanism. Omnichannel business model innovation has been proven to strengthen the influence of organizational resilience on business performance. These findings enrich the strategic management literature by highlighting the importance of synergies between adaptive capabilities, organizational resilience, and business model innovation in the context of SMEs. This research makes a theoretical contribution by expanding the literature on dynamic capabilities in the context of culture-based SMEs. The findings of the study confirm that the influence of dynamic capabilities on business performance is indirect and mediated by organizational resilience. In addition, this study enriches the field of business model innovation by positioning omnichannel as a contextual factor that enhances the effectiveness of organizational resilience. For batik SMEs, the results of this study indicate that the development of adaptive capabilities should be balanced with efforts to build organizational resilience, such as diversifying sales channels, strengthening business networks, and enhancing operational flexibility. Local governments and SME support institutions are also encouraged to promote the adoption of omnichannel business model innovations through technology training and facilitation. This research has several limitations, including the use of a cross-sectional design and a focus on a single geographical area. Future research is suggested to use a longitudinal approach or mixed methods to explore the process of forming organizational resilience more deeply, and to expand the research context to other creative sectors.

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