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Product Innovation and SME Performance: The Roles of Strategic Orientations and IT Utilization in Batik SMEs

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ABSTRACT

This study explores how small and medium-sized enterprises (SMEs) in traditional cultural sectors—like Trusmi's batik industry—balance cultural preservation with market adaptation and digital transformation. Prior research often views market orientation, entrepreneurial orientation, and IT utilization as direct performance drivers, but their mechanisms—especially in culturally rooted industries—remain understudied. The research highlights ***product innovation*** *as a critical intermediary, linking these three capabilities to performance. It examines whether IT enhances performance directly or indirectly by fostering innovation. A quantitative survey of 51 batik SMEs in Trusmi, analyzed using PLS-SEM (SmartPLS 4.0), finds that market orientation, entrepreneurial orientation, and IT utilization significantly boost product innovation, which in turn improves performance. Key findings include IT's* ***negative direct effect*** *on performance but a* ***positive indirect effect*** *through innovation, indicating inconsistent mediation. Theoretically, this extends the Resource-Based View and Dynamic Capabilities Perspective, showing IT's value lies in driving innovation. Practically, batik SMEs should integrate IT into cu****stomer value creation r****ather than adopting it passively. Ultimately, performance depends on SMEs' ability to convert resources—including IT—into innovations that align with market demands. The study emphasizes innovation's role as a bridge between capabilities and sustained success in culturally significant industries.*

ABSTRAK

Usaha Kecil dan Menengah (UKM) batik di Trusmi, Cirebon, menghadapi tantangan dalam mempertahankan identitas budaya mereka sekaligus beradaptasi dengan perubahan pasar dan digitalisasi. Studi ini meneliti inovasi produk sebagai mekanisme yang menghubungkan orientasi pasar, orientasi kewirausahaan, dan pemanfaatan TI terhadap kinerja UKM. Survei terhadap 51 UKM batik dianalisis menggunakan PLS-SEM. Hasil menunjukkan bahwa ketiga variabel tersebut memiliki pengaruh positif yang signifikan terhadap inovasi produk, yang meningkatkan kinerja. Namun, pemanfaatan TI memiliki dampak langsung negatif terhadap kinerja tetapi dampak tidak langsung positif melalui inovasi. Temuan ini memperluas perspektif Resource-Based View dan kemampuan dinamis, sekaligus menekankan pentingnya integrasi TI dalam penciptaan nilai pelanggan.

1. INTRODUCTION

Small and medium-sized enterprises (SMEs) play a vital role in local economic development, employment, and preserving traditional industries. In emerging economies such as Indonesia, SMEs operating in cultural and craft-based industries must preserve distinctive local products while responding to changing consumer preferences, increasing competition, and the growing importance of digitalization (Febriana & Praptoyo, 2015). The Indonesian batik industry is an important context in which to examine these issues, with Trusmi in Cirebon being one of its most prominent centers. Despite its established position, concerns remain about

the performance of SMEs, product innovation, and the entrepreneurial capabilities of business owners, as well as their ability to utilize information technology effectively (Rokhman & Setiawan, 2023), suggesting that access to markets and technology alone may not be sufficient to generate sustainable performance improvements.

A growing body of SME research emphasizes the importance of market orientation, entrepreneurial orientation, and information technology utilization in strengthening firm competitiveness (Kowalik et al., 2022; Ngo, 2023). Market orientation enables companies to understand customer needs, monitor competitors, and respond to ever-changing market conditions. In contrast, entrepreneurial orientation encourages the identification of opportunities and proactive decision-making. The use of information technology increasingly supports these activities by facilitating access to market information, communication with customers, and product development. Although these capabilities are widely recognized as important for the development of MSMEs, their contribution to business performance is not always direct or uniform. In particular, the use of technology does not automatically lead to better business outcomes; its value depends, among other things, on how effectively a company integrates technological resources into its business activities. Against this backdrop, product innovation represents an important potential mechanism through which strategic and technological capabilities can be translated into improved SME performance (Azizah & Nuvriasari, 2024). Market-oriented firms utilize insights into customer preferences and competitors' activities to refine product design and quality, whereas entrepreneurial-oriented firms actively seek opportunities to develop new offerings. Similarly, firms that utilize information technology can draw on customer data and emerging market trends as a basis for product development. Previous empirical studies generally support these relationships, indicating that market orientation, entrepreneurial orientation, and IT use are key organizational capabilities associated with product innovation.

One particularly interesting issue in the literature is the relationship between IT use and SME performance. Although the use of information technology is positively correlated with product innovation, its direct relationship with firm performance may be negative (ArminKia et al., 2025). Simultaneously, product innovation is recognized as a key predictor of performance, suggesting that IT use may indirectly contribute to business outcomes by supporting the development of innovative products. This raises an important question: Why does technology appear to facilitate product innovation without directly improving performance? This issue is particularly relevant for traditional industries deeply rooted in culture, where the benefits of technology adoption may take time to materialize as measurable business outcomes (Kahveci, 2025). In this context, SMEs may need to develop complementary organizational capabilities to transform technological resources into commercially valuable products. Consequently, focusing exclusively on the direct relationship between IT utilization and performance may overlook the processes through which technology creates business value.

Although interest in these relationships continues to grow, the empirical findings remain mixed. Although market orientation is generally associated with better SME performance, evidence regarding entrepreneurial orientation and product innovation is less consistent, with some studies reporting non-significant relationships between these variables. Research on information technology also tends to focus on its direct relationship with firm performance or product innovation, meaning that the processes linking technology adoption to business outcomes are not fully understood (Ngo, 2023; Febrianda et al., 2025). Three gaps emerge in the existing literature. First, previous research has largely examined market orientation, entrepreneurial orientation, and IT use in relation to MSME performance through direct effects, thereby providing limited insight into how these capabilities translate into tangible business outcomes. Second, empirical findings regarding the relationship between entrepreneurial orientation, IT utilization, product innovation, and SME performance vary across different research contexts. This inconsistency suggests that the contribution of organizational capabilities to performance may depend on the processes firms use to transform them into innovative outcomes. Third, relatively few studies have focused on SMEs operating in traditional cultural industries in developing countries. Companies in this environment face the dual challenge of adapting to ever-changing market demands and technological developments while simultaneously preserving the cultural identity that distinguishes their products. Addressing this gap is essential for developing a more comprehensive understanding of how strategic and technological capabilities contribute to the performance of SMEs through product innovation in traditional industries.

This study examines these gaps by positioning product innovation as a mechanism linking market orientation, entrepreneurial orientation, and IT use to MSME performance. This study also examines whether the relationship between IT utilization and performance is direct or indirect via product innovation, an issue worthy of attention given the varied findings in the literature (ArminKia et al., 2025). The empirical results

reveal a distinctive pattern: IT utilization is positively correlated with product innovation but has a direct negative relationship with SME performance, while its indirect relationship with performance through product innovation is positive. This inconsistent mediation pattern challenges the assumption that technology adoption always leads to improved business outcomes and highlights the importance of examining the pathways through which technological resources create value. By integrating strategic orientation, IT utilisation, product innovation, and SME performance within the context of the Indonesian batik industry, this study broadens the discussion on capability development and innovation beyond conventional business environments to traditional cultural industries. Consequently, this study makes a specific contribution to the SME literature by demonstrating that the performance implications of technology utilization must be understood in conjunction with a firm's ability to translate technology into product innovations relevant to the market (Kahveci, 2025).

Against this background, this study examines how market orientation, entrepreneurial orientation, and the use of information technology relate to product innovation and the performance of SMEs among batik SMEs in Trusmi, Cirebon, Indonesia. This study also investigates the mediating role of product innovation in these relationships, positioning innovation as a mechanism that enables the translation of strategic and technological capabilities into business performance. By integrating these relationships within a single framework, this study aims to deepen our understanding of how traditional SMEs utilize their capabilities to respond to changes in market demand and to competitive pressures.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Theoretical Foundation: Resource-Based View and Dynamic Capabilities

The relationship between strategic orientation, IT utilization, product innovation, and SME performance can be understood through the complementary perspectives of the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT). The RBV explains differences in firm performance based on variations in the resources and capabilities possessed by firms and their potential to create competitive advantages. Barney (1991) argues that resources are more likely to generate sustainable competitive advantages if they are valuable, rare, difficult to imitate, and non-substitutable. From this perspective, market orientation, entrepreneurial orientation, and IT utilization can provide strategic benefits by strengthening a firm's ability to understand market needs, identify business opportunities, and access relevant information. However, merely possessing or utilizing these resources does not guarantee superior performance; their contribution depends on how effectively the company uses them in its business activities (Dukhaykh & Alangri, 2026).

However, possessing valuable resources does not always translate into superior performance, particularly in markets characterized by constantly changing customer preferences and competitive pressure. Companies must also mobilize, combine, and reconfigure their resources to respond effectively to these changes. This is the central argument of the Dynamic Capabilities Theory (DCT), which emphasizes a firm's ability to integrate, build, and reconfigure internal and external capabilities in line with developments in its environment (Teece et al., 1997). While the Resource-Based View (RBV) explains the strategic value of a firm's resources, DCT provides a complementary perspective on how these resources can be adapted and utilized to generate business value. From this perspective, product innovation can serve as a key mechanism for translating organizational capabilities into competitive outcomes. This argument is particularly relevant to SMEs, whose ability to transform strategic resources and technology into marketable innovations determines the extent to which these resources contribute to business performance (Ferreira et al., 2021).

This distinction is particularly important in the context of MSMEs. Despite information technology, market knowledge, an entrepreneurial mindset, and innovation capabilities being valuable resources, their contribution to business performance depends on how effectively a company mobilizes and transforms these resources into marketable products. This perspective is consistent with recent research on MSMEs, which indicates that digital technology does not always improve performance. Rather, its value may depend on a company's ability to develop complementary innovation capabilities, strengthen digital competencies, and establish organizational processes that transform technological resources into commercially meaningful outcomes (Khurana et al., 2022; Mansouri et al., 2022).

Consequently, this study considers market orientation, entrepreneurial orientation, and the utilization of IT as strategic and technological capabilities that can support business development. Product innovation is positioned as a key mechanism that enables these capabilities to be translated into market-relevant offerings and improved performance. This perspective is highly relevant to the role of IT utilization, as its contribution to MSME performance may depend on its application in product innovation, rather than solely on a direct

relationship with performance itself (ArminKia et al., 2025).
This theoretical perspective goes beyond the assumption that strategic orientation and technology adoption will automatically improve business performance. Instead, it focuses on how companies translate their resources and capabilities into meaningful outcomes through product innovation. This argument aligns with the view that dynamic capabilities do not automatically generate competitive advantages; their contribution depends on how effectively these capabilities are aligned with the company's strategic direction and applied to activities that create value in the market. For SMEs, this highlights the importance of linking strategic objectives and technological resources to product development that responds to customer needs and supports business performance (Fainshmidt et al., 2019).

Market Orientation
Market orientation refers to an organization's ability to generate, disseminate, and respond to market information. Kohli and Jaworski conceptualized this orientation in terms of the production of information, its dissemination across organizational functions, and responsiveness to market information (Saleh et al., 2021).
Complementing this perspective, Narver and Slater view market orientation as an organizational culture comprising customer orientation, competitor orientation, and inter-functional coordination, with empirical evidence linking these dimensions to business profitability (Kolbe et al., 2022).
Market orientation is particularly relevant for MSMEs operating in competitive markets, where limited financial and human resources mean that failed product decisions can be highly disadvantageous (Farida et al., 2021). By developing a clearer understanding of customer preferences, competitors' strategies, and ever-changing market conditions, market-oriented firms are better placed to identify unmet needs and integrate market insights into product development, including changes in design, features, quality, and packaging (Abdulsamad et al., 2021). This capability is particularly important for SMEs, which must utilize their limited resources effectively while responding to ever-evolving market demand.
Previous research provides empirical support for the relationship between market orientation and innovation. Laforet's study of non-high-tech manufacturing MSMEs linked strategic orientation and market orientation to innovation, while subsequent research reported a similar relationship between market-oriented behavior and innovation outcomes in the context of developing countries (Hashmi et al., 2022). Further studies have examined the relationship between market orientation, product innovation, and SME performance, reinforcing the relevance of market orientation to innovation-driven business development (Liu et al., 2022).
In the context of batik SMEs in Trusmi, market orientation can be understood as an organizational capability that enables firms to translate information about customers and competitors into product development decisions while remaining responsive to ever-changing market preferences.
H1: Market orientation positively affects product innovation.

Market orientation can also directly impact SME performance by enabling them to respond more effectively to customer needs and competitive conditions. A deep understanding of customer preferences and competitors' strategies enables companies to refine their marketing activities, strengthen customer value, and improve their market position (Wasim et al., 2024). This relationship is consistent with foundational research on market orientation and business performance and is further supported by recent studies on SMEs that highlight the importance of market responsiveness in achieving profitable business outcomes (Abdulsamad et al., 2021).
H2: Market orientation positively affects SME performance.

Entrepreneurial Orientation
Entrepreneurial orientation (EO) reflects a company's strategic stance toward entrepreneurship, which is traditionally characterized by innovation, proactivity, and a willingness to take risks. Further research has also considered competitive aggressiveness and autonomy as additional dimensions of this construct (Wadood et al., 2022). However, Lumpkin and Dess argued that EO should not always be treated as a homogeneous construct, as its relationship with firm performance may vary according to organizational characteristics and environmental conditions (Lumpkin & Dess, 1996).
For SMEs, entrepreneurial orientation can encourage the search for new business opportunities and facilitate experimentation with products, markets, and business practices (Dung et al., 2021). These behaviors are highly relevant to product innovation, as they enable firms to challenge established routines, explore

alternative approaches, and respond proactively to emerging market opportunities. Rather than relying solely on existing products and established practices, entrepreneurially oriented firms are more likely to explore new possibilities in product development.

Empirical research increasingly highlights the relevance of entrepreneurial orientation to innovation. Avlonitis and Salavou examined entrepreneurial orientation, levels of product innovation, and performance among 149 MSMEs in the manufacturing sector and identified differences in the levels of product innovation across various entrepreneurial profiles (Avlonitis & Salavou, 2007a). Their findings suggest that entrepreneurial orientation provides a useful perspective for understanding how firms approach product development, rather than merely examining its relationship with performance in isolation. This argument is consistent with subsequent research linking entrepreneurial orientation to organizational learning and competitive capabilities among SMEs (Pratono et al., 2019) and studies examining the relationship between entrepreneurial orientation, market orientation, product innovation, and firm performance (Ta'Amnha et al., 2023).

In the context of batik MSMEs in Trusmi, entrepreneurial orientation can encourage firms to experiment with new motifs and designs, respond proactively to changing consumer preferences, and pursue opportunities for product differentiation. These activities assist businesses in exploring new market opportunities while retaining the distinctive characteristics of traditional batik. Therefore, an entrepreneurial orientation is expected to have a positive relationship with product innovation, although the extent of this relationship depends on the business's ability to translate entrepreneurial initiatives into products that are relevant to the market.

Entrepreneurial orientation may also be directly linked to MSME performance, as firms that proactively identify and pursue business opportunities are better positioned to respond to market changes and capitalize on emerging opportunities (Nuryakin, 2021). However, this relationship is not consistent across all firms in the industry. As emphasized by Lumpkin and Dess, the implications of entrepreneurial orientation for performance may depend on organizational characteristics and environmental conditions, suggesting that entrepreneurial behavior alone does not guarantee superior outcomes.

H4: Entrepreneurial orientation positively affects SME performance.

Information Technology Utilisation

The utilization of information technology (IT) refers to the extent to which a company uses technological tools to support information processing, communication, marketing, operational activities, and customer engagement. From the Resource-Based View (RBV) perspective, technology can be a valuable organizational resource. However, access to and use of technology do not automatically confer competitive advantages. Its strategic value depends on the complementary capabilities developed by the company and its ability to integrate technological resources into daily business processes (Hassan et al., 2024).

This distinction is increasingly recognized in SME research. A study of 1,100 SMEs in Germany found a positive relationship between digital diffusion and innovation performance, highlighting the importance of integrating digital technology into the company's broader organizational capabilities (Hassan et al., 2024). Similarly, research on digital transformation suggests that innovation can act as a mediator, enabling digital initiatives to contribute to SME performance (Teng et al., 2022). Overall, these findings indicate that the benefits of using technology extend beyond mere adoption and depend, in part, on how firms integrate technological resources into their innovation and value creation processes.

Therefore, the role of IT utilization can be understood in two interrelated yet distinct ways. First, technology can support product innovation by improving access to market information, facilitating communication with customers, enabling digital marketing, and providing tools for product development (Hassan et al., 2024). Second, its contribution to overall business performance depends on whether the implementation of this technology can be translated into commercially valuable outcomes (Usai et al., 2021). This distinction is important because improved access to information and communication does not always result in direct benefits in terms of sales, profitability, or other performance indicators.

For batik SMEs in Trusmi, IT facilitates access to consumer trends, online markets, digital promotional channels, design inspiration, customer feedback, and communication with buyers. These applications provide opportunities to identify emerging preferences and integrate market insights into the product development process. However, their contribution to innovation depends on how effectively companies utilize the available information and tools to refine existing products or develop new offerings. Consequently, IT use can be viewed as a supporting resource for product innovation rather than a guarantee of improved performance.

H5: Information technology utilization has a positive effect on product innovation.

The direct link between IT use and SME performance makes theoretical sense, as technology can improve operational efficiency, expand market reach, facilitate communication, and strengthen customer engagement (Teng et al., 2022). Nevertheless, the benefits of digitalization are not evenly distributed across all SMEs, as each firm has varying capabilities in integrating technology into business operations and translating its use into measurable performance improvements (Usai et al., 2021).
Consequently, this study posits the hypothesis that there is a direct positive relationship between the use of IT and SME performance while acknowledging that the benefits realized may depend on how effectively firms deploy their technological resources.
H6: Information technology utilization positively affects SME performance.

Product Innovation and SME Performance
Product innovation involves developing new products, modifying existing offerings, or enhancing product features to provide greater value to customers. For MSMEs, this can be a key means of differentiation and adaptation, particularly in markets characterized by constantly changing consumer preferences and fierce competition (Hadi, 2023).
From the perspective of Dynamic Capabilities Theory (DCT), product innovation is a process whereby firms apply and transform knowledge and other resources into marketable offerings. Consequently, product innovation is more than merely the result of strategic orientation; it can also function as a mechanism that transforms strategic and technological capabilities into products of commercial value (Kolbe et al., 2021). This distinction is particularly important for SMEs, where resource constraints make the conversion of existing capabilities into market-relevant offerings essential.
Previous research supports the relevance of product innovation to MSME performance. Avlonitis and Salavou highlighted the importance of the level of product innovation in understanding the differences in innovation outcomes and MSME performance (Avlonitis & Salavou, 2007b). Other studies have examined product innovation as a mediating mechanism linking market orientation to firm performance, and recent evidence suggests that innovation can make a positive contribution to MSME performance, particularly when firms are responsive to market demand (Hadi, 2023). Further research has also linked product innovation to competitive performance and long-term business sustainability (Liu, 2022). Overall, these findings suggest that product innovation can serve as a bridge between a firm's internal capabilities and its ability to achieve profitable market outcomes (Liu, 2022).
In the context of batik SMEs in Trusmi, product innovation may involve introducing new motifs, combining traditional patterns with contemporary designs, diversifying the product range, improving packaging, or developing new applications for batik products. These innovations enable firms to respond to ever-changing consumer preferences while maintaining the cultural identity that characterizes traditional batik. Consequently, product innovation can help these businesses balance market adaptation with cultural preservation, thereby reinforcing the relevance of innovation to sustainable competitiveness.
H7: Product innovation positively affects SME performance.

Product Innovation as a Mediating Mechanism
The previous discussion has shown that the relationship between strategic and technological capabilities and MSME performance extends beyond mere direct effects. Market orientation enables firms to understand customers and competitors; entrepreneurial orientation fosters proactive behavior and the identification of opportunities; and the utilization of IT facilitates access to, processing of, and dissemination of market information (Hassan et al., 2024).
However, these capabilities create business value, partly through their application in developing products that meet market needs. Therefore, product innovation is a potential mechanism that firms use to transform their internal resources and capabilities into marketable offerings.
This argument is consistent with Dynamic Capabilities Theory (DCT), which emphasizes the importance of organizational processes in transforming resources into value-creating outcomes. In this study, product innovation represents one such process that links a firm's strategic and technological capabilities to products capable of generating market value (Kolbe et al., 2021). For market-oriented SMEs, insights into customer preferences and competitors' activities can form the basis for changes in product design, quality, and variety, thereby strengthening the relevance of their offerings to market demand. Consequently, market orientation can contribute to SME performance both directly and indirectly through product innovation (Hadi, 2023).

H8: Product innovation mediates the relationship between market orientation and SME performance.
In the context of an entrepreneurial mindset, a proactive and innovative strategic approach can encourage experimentation and the development of new products, which in turn enhances a company's ability to create value and competitiveness for its customers (Ta'Amnha et al., 2023).
H9: Product innovation mediates the relationship between entrepreneurial orientation and SME performance.

The role of IT utilization is crucial. Information technology provides MSMEs with access to market information, customers, digital markets, and communication channels that can support their development. However, the availability or use of these resources does not necessarily translate to improved performance. The value of these resources may depend on how effectively firms apply them to develop new products and enhance existing offerings.
Recent research supports the broader argument that digital technology can influence SME performance through innovation-related processes. For example, Merín-Rodrigáñez et al. (2024) found that business model innovation partially mediates the relationship between digital transformation and firm performance (Merín-Rodrigáñez et al., 2024). Similarly, Hassan et al. (2024) reported a positive relationship between digital diffusion and innovation performance, highlighting the importance of organizational capabilities in transforming technological resources into innovative outcomes (Hassan et al., 2024). Although these studies examine various forms of innovation, they all show that the benefits of technology for companies are determined by the extent to which the technology is utilized and integrated into the innovation process.
Consequently, product innovation can serve as a key channel through which IT utilization contributes to SME performance. By transforming technological inputs and market information into products that meet customer needs, firms may be better positioned to realize the commercial value of their technological resources. This relationship is particularly relevant for batik SMEs, where technology can support product development and help firms adapt to ever-changing market preferences.
H10: Product innovation mediates the relationship between information technology utilisation and SME performance.

Conceptual Framework
This study draws on the arguments presented above to develop the hypotheses. It combines the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT). These theories are used to explain the performance of SME batik. RBV provides a solid foundation for understanding the strategic value of market orientation, entrepreneurial orientation, and information technology as organizational resources and capabilities. However, possessing these resources is insufficient to guarantee favorable market outcomes for the firm. DCT further elaborates on this by emphasizing how SMEs adapt, deploy, and reconfigure their resources in response to changing market conditions. Integrating these perspectives offers a more comprehensive understanding of the resources that are important to batik SMEs and the processes through which they contribute to market outcomes.

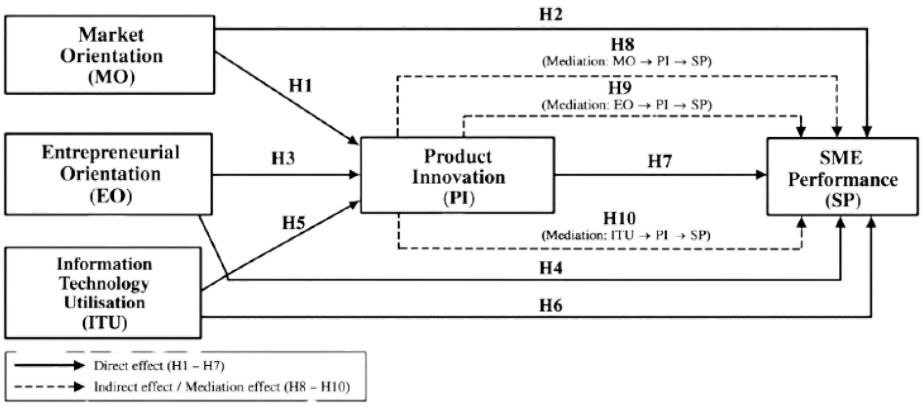


Figure 1. Conceptual Framework

In the proposed framework, market orientation is defined as a firm's ability to understand market conditions by gathering and responding to information about customers and competitors. In contrast, entrepreneurial orientation encompasses a firm's proactive approach to identifying opportunities, exploring new ideas, and

influencing market developments. Information technology serves as a resource that facilitates information processing, communication, and market access for investors. These strategic and technological capabilities contribute to product innovation by providing a means of translating organizational resources into value recognized by customers. From a dynamic capabilities perspective, resources and capabilities are more likely to generate economic benefits when implemented through organizational processes that produce meaningful outcomes. Consequently, SME performance is considered the ultimate outcome of these processes.

This framework suggests that market orientation, entrepreneurial orientation, and the utilization of information technology may influence SME performance in two possible ways. The first pathway is indirect, whereby these factors contribute to performance through innovation. The second involves a direct relationship, whereby each factor can independently influence SME performance, regardless of its contribution to innovation performance. This distinction acknowledges that certain organizational benefits can arise directly from a better understanding of the market, entrepreneurial initiatives, or the effective use of technology, while others depend on a firm's ability to translate these capabilities into new or improved products.

One of the most important theoretical propositions in this framework concerns information technology. Rather than assuming a simple linear relationship between technology and performance, the framework acknowledges that technological resources primarily generate value through intermediary innovation processes. This proposition is consistent with contemporary SME research showing that digital technology and innovation capabilities tend to operate in tandem rather than independently. The strategic assimilation of digital tools into organizational processes ultimately drives superior innovation and performance outcomes rather than simply possessing them (Hassan et al., 2024). Overall, product innovation has been positioned as a central mechanism linking market orientation, entrepreneurial orientation, and information technology utilization to SME performance by this integrated RBV–DCT framework, while the direct effects that each capability may have individually have been accommodated.

3. RESEARCH METHOD

This study employed a quantitative, cross-sectional survey to examine the relationship between market orientation, entrepreneurial orientation, utilization of information technology, product innovation, and SME performance. This study focused on batik SMEs operating in Trusmi Village, Plered District, Cirebon Regency, Indonesia, and data were collected between November 2025 and May 2026.

Trusmi was selected as the location for the study because of its well-established concentration of batik enterprises, making it an ideal setting for examining the strategic and technological factors associated with SME performance. While batik production is rooted in traditional craftsmanship, businesses in this sector must respond to evolving consumer preferences and the increasing importance of digital technology in business activities. This provides an appropriate context to investigate whether product innovation can translate strategic orientations and technology utilization into improved business performance.

Individual batik SMEs served as the unit of analysis. Data were obtained from business stakeholders using a structured questionnaire designed to measure the variables of this study. A cross-sectional approach was adopted because the variables were examined within a single survey-based study period, rather than being tracked repeatedly over time.

Population and Sampling

This study covers batik micro, small, and medium-sized enterprises (MSMEs) in Trusmi Village, Plered District, Cirebon Regency. Fifty-one registered businesses were identified as the target population for this research. Owing to the small size of this population, this study adopted a census approach, also known as saturation sampling, to include all 51 MSMEs. Therefore, the sample size was equal to the total population size.

This approach is considered appropriate because the entire identified population can be accessed for data collection. By including every registered batik MSME in the study area, the study aimed to provide a comprehensive overview of the population rather than selecting a small subset of businesses. However, the findings must be interpreted in relation to the defined population and research context.

Data Collection

The primary data for this study were obtained using a structured questionnaire, which was administered to batik micro, small and medium enterprises (MSMEs) in Trusmi Village. The respondents were asked to indicate their level of agreement with each statement on a five-point Likert scale ranging from 1 (strongly

disagree) to 5 (strongly agree).
The questionnaire was designed to measure five constructs: market orientation, entrepreneurial orientation, utilization of information technology, product innovation, and MSME performance. To complement the survey findings, this study used observational and documentary evidence. Secondary data were obtained from the Central Statistics Agency (BPS) and other relevant institutions to provide additional context.

Measurement of Variables
This research model incorporates three exogenous constructs: market orientation (MO), entrepreneurial orientation (EO), and information technology utilisation (IT). Product innovation (PI) acts as a mediating construct, and SME performance (SP) is an endogenous construct.
Each construct was measured using several items from a questionnaire rated on a five-point Likert scale. The research instrument consisted of 28 items developed based on the established conceptual dimensions of the five constructs. The constructs and their respective measurement dimensions are listed in Table 1.

Table 1. Measurement of Construct

Construct	Dimensions	Number of Items	Measurement Focus
Market Orientation (MO)	Customer orientation; competitor orientation; inter-functional coordination	5	Customer value, customer information, competitor strategies, competitor weaknesses, and market trends
Entrepreneurial Orientation (EO)	Proactiveness; innovativeness; risk-taking	5	Opportunity recognition, anticipation of market needs, new product creation/development, and risk-taking
Information Technology Utilisation (ITU)	Intensity; frequency; number of applications/software	5	Frequency and intensity of technology use and number of applications utilised
Product Innovation (PI)	Product quality; product variety; style/design	5	Product durability/precision, size, price, design variation, and modern products
SME Performance (SP)	Sales, capital, employment, market/marketing, and profit growth	8	Changes in sales, capital, employees, market size, and business profit

Source: developed by authors

Data Analysis
Data analysis was conducted using partial least squares structural equation modelling (PLS-SEM) in SmartPLS. This technique was chosen to evaluate the relationships between various latent constructs, including direct and indirect effects via the mediating variable of product innovation.
The analysis comprised two stages. First, the measurement (outer) model was assessed to determine the reliability and validity of the constructs used. Second, the structural model (inner model) was examined to evaluate the hypothesized relationships between the constructs and to determine whether product innovation mediates the relationship between exogenous variables and SME performance.

Measurement Model Evaluation
The measurement model was evaluated to determine whether the constructs demonstrated adequate convergent and discriminant validity and internal consistency reliability. Convergent validity was examined using indicator loadings and average variance extracted (AVE). Loadings of approximately 0.70 or higher and AVE values exceeding 0.50 were used as reference criteria, indicating that the constructs explained a sufficient proportion of the variance in their respective dimensions.
Discriminant validity was assessed using the Heterotrait–Monotrait Ratio (HTMT), with values below 0.90 being considered acceptable (Henseler et al., 2015). The Fornell–Larcker criterion was also applied as a complementary assessment tool. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability, with values above 0.70 generally indicating satisfactory reliability.

Structural Model Evaluation

After establishing the adequacy of the measurement model, the structural model was evaluated using collinearity diagnostics, the coefficient of determination (R^2), effect size (f^2), and bootstrap-based significance testing.

Collinearity was examined using the variance inflation factor (VIF). Lower VIF values indicate lower collinearity among the predictor constructs. Inner VIF values below 5 (ideally, below 3.3) indicate no critical collinearity.

The explanatory power of the structural model was assessed using R^2, which indicates the proportion of variance in the endogenous construct explained by the predictors. Effect size was assessed using f^2 to determine the contribution of individual exogenous constructs to the endogenous constructs.

The hypotheses were tested using bootstrapping to examine the estimated path coefficient, t-statistic, and p-value. The sign and magnitude of the path coefficients indicate the direction and strength of each relationship, whereas the t-statistics and p-values assess statistical significance.

The mediation hypotheses were assessed using specific indirect effects generated through bootstrapping. This allowed the study to determine whether product innovation transmits the effects of market orientation, entrepreneurial orientation, and information technology utilization on SME performance.

Mediation Analysis

Product innovation was specified as a mediating construct between the three exogenous variables and SME performance.

The indirect effects were evaluated through bootstrapping by examining the significance and direction of

1. Market Orientation → Product Innovation → SME Performance (H8)
2. Entrepreneurial Orientation → Product Innovation → SME Performance (H9)
3. Information Technology Utilisation → Product Innovation → SME Performance (H10)

This approach allows us to distinguish between direct and indirect effects, which are central to the theoretical argument developed in this study.

Importantly, mediation analysis is particularly relevant to the IT utilization relationship because the study observes a differentiated pattern between its direct and indirect relationships with the performance of SMEs. The results show that IT utilization is positively associated with product innovation, while its direct relationship with SME performance is negative and significant, and its indirect relationship through product innovation is positive and significant.

Model Specification of Study

The structural model can be expressed by the following two equations:

1. Product Innovation Equation

$$PI = \beta_1 MO + \beta_2 EO + \beta_3 ITU + \zeta_1 \quad (1)$$

where:
PI = Product Innovation
MO = Market Orientation
EO = Entrepreneurial Orientation
ITU = Information Technology Utilisation
β = structural path coefficients
ζ_1 = residual term

2. SME Performance Equation

$$SP = \beta_4 MO + \beta_5 EO + \beta_6 ITU + \beta_7 PI + \zeta_2 \quad (2)$$

where:
SP = SME Performance
PI = Product Innovation
MO = Market Orientation
EO = Entrepreneurial Orientation
ITU = Information Technology Utilisation

ζ_2 = residual term

These equations correspond to the seven direct-effect hypotheses (H1–H7), while H8–H10 represent the three indirect/mediation relationships.

4. DATA ANALYSIS AND DISCUSSION

Respondent Profile and Descriptive Statistics

The empirical analysis was based on data collected from 51 batik SMEs in Trusmi, Cirebon, Indonesia. Because the number of identified SMEs in the research setting was relatively small, a census sampling approach was employed, whereby all identified business owners and managers were included in the study. The respondent profile indicates a relatively heterogeneous group of business operators.

Women accounted for 50.9% of the respondents, while men accounted for 49.1%. In terms of age, 41.1% of the respondents were aged 36–44 years and 33.3% were aged 45 years or above. Most respondents had completed senior high school education (56.9%). Regarding business experience, the largest group had operated their businesses for 11–20 years (37.3%), while 23.5% had operated for less than 10 years. In terms of employment size, 54.9% of the businesses employed between one and five workers, indicating the predominantly small-scale nature of the businesses examined. Annual business income was below IDR 50 million for 45.1% of the respondents.

Table 2 summarizes the descriptive statistics of the five constructs. The mean values were calculated from the respective measurement items.

Table 2. Descriptive Statistics of the Constructs

Construct	No. of items	Mean*	General pattern
Market orientation	5	3.259	Moderate
Entrepreneurial orientation	5	3.898	Relatively high
Information technology utilisation	5	3.894	Relatively high
Product innovation	5	4.220	High
SME performance	8	3.667	Moderate to relatively high

Source: developed by authors

The descriptive results provide an initial picture of the business's context. Product innovation recorded the highest overall mean, whereas market orientation showed the lowest average among the three antecedent constructs. Within market orientation, the lowest-scoring item concerned the respondents' understanding of competitors' weaknesses (mean = 2.510). In contrast, the highest item-level mean was observed for product pricing according to size, design, and raw material quality within the product innovation construct (mean = 4.471). For information technology utilization, the highest mean concerned the perceived ease of performing business activities through information technology (mean = 4.353), whereas the use of more than one application or software had the lowest mean (3.353).

These descriptive patterns suggest that technology was generally perceived as useful by the respondents, but its breadth of application was comparatively limited. Simultaneously, respondents reported relatively strong product-related adaptation and innovation activities. This distinction is relevant when interpreting the structural relationship between information technology utilization, product innovation, and SME performance.

Measurement Model Assessment

The measurement model was assessed using PLS-SEM with SmartPLS 4.0. All five constructs (market orientation, entrepreneurial orientation, information technology utilization, product innovation, and SME performance) were specified as reflective constructs. The assessment focused on indicator reliability, convergent validity, discriminant validity, and internal consistency reliability.

Indicator Reliability and Convergent Validity

All 28 measurement items produced outer loadings of 0.708 or higher. The loadings ranged from 0.708 to 0.901, indicating that each indicator contributed substantially to its construct. The lowest loading was observed for several items at 0.708, while the highest loading was 0.901 for one product innovation indicator. The AVE values were also above the conventional threshold of 0.50 for all constructs: 0.666 for market orientation, 0.609 for entrepreneurial orientation, 0.654 for information technology utilisation, 0.620 for

product innovation, and 0.563 for SME performance. These results indicate adequate convergent validity across the measurement model.

Table 3. Measurement Model Assessment

Construct	Items	Loading range	AVE	CR (rho_a)	CR (rho_c)	Cronbach's α
Market orientation	5	0.708–0.856	0.666	0.850	0.890	0.846
Entrepreneurial orientation	5	0.708–0.812	0.609	0.814	0.865	0.807
Information technology utilisation	5	0.712–0.850	0.654	0.841	0.886	0.839
Product innovation	5	0.755–0.901	0.620	0.882	0.909	0.875
SME performance	8	0.756–0.884	0.563	0.928	0.938	0.924

Source: developed by authors

The reliability results further support the adequacy of the measurement models. Cronbach's alpha values ranged from 0.807 to 0.924, while the composite reliability values (rho_c) ranged from 0.865 to 0.938. All values exceeded the commonly accepted threshold of 0.70.

Discriminant Validity

Discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT), Fornell–Larcker criterion, and cross-loadings. The HTMT values ranged from 0.357 to 0.793, all below 0.90. This indicates that the five constructs are empirically distinguishable.

The Fornell–Larcker criterion provides consistent results. The square root of the AVE for each construct exceeded its correlation with the other constructs. For example, the square root of the AVE for product innovation was 0.816, compared with correlations of 0.582 for market orientation, 0.653 for entrepreneurial orientation, and 0.597 for information technology utilization.

The cross-loading assessment also showed that each indicator loaded more strongly on its assigned construct than on the other constructs. For example, the loading of the product innovation indicators on product innovation ranged from 0.755 to 0.901, whereas their cross-loadings on the other constructs remained lower. A similar pattern was observed for the market, entrepreneurial, information technology utilization, and SME performance indicators.

Taken together, these results indicate that the measurement model demonstrates satisfactory convergent validity, discriminant validity, and internal consistency. Therefore, all 28 indicators were retained for the structural model assessment.

Structural Model Assessment

After the measurement model was assessed satisfactorily, the structural model was evaluated. The analysis examined collinearity, path coefficients, effect sizes, and explanatory powers. Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS 4.0 software.

Collinearity Assessment

The inner VIF values ranged from 1.332 to 2.382, which were below the commonly used threshold of three. This indicates that serious collinearity was not present among the predictor variables.

Table 4. Structural Model Results

Relationship	β	t-value	p-value	Result
Market orientation → Product innovation	0.304	3.703	<0.001	Supported
Market orientation → SME performance	0.231	2.034	0.045	Supported
Entrepreneurial orientation → Product innovation	0.373	3.657	<0.001	Supported
Entrepreneurial orientation → SME performance	0.334	3.132	0.002	Supported
Information technology utilisation → Product innovation	0.267	2.548	0.012	Supported
Information technology utilisation → SME performance	-0.282	2.182	0.031	Negative significant relationship
Product innovation → SME performance	0.553	4.252	<0.001	Supported

Source: developed by authors

The results of the structural model revealed several consistent relationships between the variables. First, market orientation was positively associated with product innovation ($\beta = 0.304$, $t = 3.703$, $p < 0.001$). This indicates that SMEs with stronger market-oriented practices tend to report greater innovation in their products.

Second, market orientation is positively associated with SME performance ($\beta = 0.231$, $t = 2.034$, $p = 0.045$). Thus, the influence of market orientation was observed at both the innovation and performance levels.

Entrepreneurial orientation demonstrated a stronger relationship with product innovation than market orientation. Its path coefficient for product innovation was 0.373 ($t = 3.657$, $p < 0.001$). Entrepreneurial orientation also showed a positive relationship with SME performance ($\beta = 0.334$, $t = 3.132$, $p = 0.002$). These results indicate that entrepreneurial orientation was associated with both the development of new or improved products and broader business performance.

Information technology utilisation was positively related to product innovation ($\beta = 0.267$, $t = 2.548$, $p = 0.012$). This finding indicates that greater utilization of information technology is associated with stronger product innovation among the surveyed batik SMEs.

However, the direct path from IT utilization to SME performance was negative and statistically significant ($\beta = -0.282$, $t = 2.182$, $p = 0.031$). This result differs from the positive relationships observed for the other antecedents. Importantly, the negative coefficient should not be described simply as a statistically insignificant effect. The estimated relationship was statistically significant, but its direction was negative.

Finally, product innovation showed the strongest direct relationship with SME performance in the structural model ($\beta = 0.553$, $t = 4.252$, $p < 0.001$). This result suggests that within the empirical model, variations in product innovation are strongly associated with variations in SME performance.

Effect Size

The effect-size analysis provides additional information beyond statistical significance. Product innovation had the largest effect on SME performance, with an f^2 value of 0.386. Entrepreneurial orientation had an f^2 value of 0.178 on SME performance and 0.215 on product innovation. Market orientation showed f^2 values of 0.104 for SME performance and 0.167 for product innovation. Information technology utilization showed smaller effect sizes, with f^2 values of 0.143 for SME performance and 0.113 for product innovation.

Table 5. Effect Size (f^2)

Predictor	Endogenous construct	f^2	Interpretation*
Market orientation	Product innovation	0.167	Moderate
Market orientation	SME performance	0.104	Small
Entrepreneurial orientation	Product innovation	0.215	Moderate
Entrepreneurial orientation	SME performance	0.178	Moderate
Information technology utilisation	Product innovation	0.113	Small
Information technology utilisation	SME performance	0.143	Small
Product innovation	SME performance	0.386	Large

Source: developed by authors

Explanatory

The effect-size analysis provides additional information beyond statistical significance. Product innovation had the largest effect on SME performance, with an f^2 value of 0.386. Entrepreneurial orientation had an f^2 value of 0.178 on SME performance and 0.215 on product innovation. Market orientation showed f^2 values of 0.104 for SME performance and 0.167 for product innovation. Information technology utilization showed smaller effect sizes, with f^2 values of 0.143 for SME performance and 0.113 for product innovation.

Table 6. Effect Size

Predictor	Endogenous construct	f^2	Interpretation*
Market orientation	Product innovation	0.167	Moderate
Market orientation	SME performance	0.104	Small
Entrepreneurial orientation	Product innovation	0.215	Moderate
Entrepreneurial orientation	SME performance	0.178	Moderate
Information technology utilisation	Product innovation	0.113	Small
Information technology utilisation	SME performance	0.143	Small
Product innovation	SME performance	0.386	Large

Source: developed by authors

Explanatory Power of the Structural Model

The model explains 58.0% of the variance in product innovation (R^2 = 0.580; adjusted R^2 = 0.553). This indicates that market orientation, entrepreneurial orientation, and information technology utilization collectively account for a substantial proportion of the observed variation in product innovation.

The model explained 66.7% of the variance in SME performance (R^2 = 0.667; adjusted R^2 = 0.638). Thus, market orientation, entrepreneurial orientation, information technology utilisation, and product innovation jointly accounted for approximately two-thirds of the variation in SME performance in the sample.

Table 7. Explanatory Power

Endogenous construct	R^2	Adjusted R^2
Product innovation	0.580	0.553
SME performance	0.667	0.638

Source: developed by authors

Mediation Analysis

The mediating role of product innovation was examined using specific indirect effects generated by the bootstrapping procedure. All three indirect relationships were statistically significant and positive.

Table 8. Specific Indirect Effect

Indirect relationship	β	t-value	p-value
Market orientation → Product innovation → SME performance	0.168	2.894	0.005
Entrepreneurial orientation → Product innovation → SME performance	0.207	2.684	0.009
Information technology utilisation → Product innovation → SME performance	0.148	2.127	0.036

Source: developed by the authors from SmartPLS 4.0

Market orientation has a positive indirect relationship with SME performance through product innovation (β = 0.168, t = 2.894, p = 0.005). This indicates that market orientation is associated with SME performance not only through its direct relationship with performance but also through product innovation.

A similar pattern was observed for the entrepreneurial orientation. Its indirect relationship with SME performance through product innovation was positive and significant (β = 0.207, t = 2.684, p = 0.009). Among the three antecedent variables, this represented the largest indirect effect.

The most distinctive mediation results concerned information technology utilization. Although information technology utilization had a negative direct relationship with SME performance (β = −0.282, p = 0.031), its indirect relationship through product innovation was positive and statistically significant (β = 0.148, p = 0.036).

This combination of coefficients indicates an inconsistent mediation pattern, in which the direct and indirect relationships operate in opposite directions. In substantive terms, information technology utilization was positively associated with product innovation, and product innovation was positively associated with SME performance; however, the direct path from information technology utilization to performance was negative. This finding is particularly relevant to the research question because it suggests that the performance implications of information technology cannot be understood solely by examining its direct association with SME performance. In this sample, part of the relationship appears to operate through innovation.

Summary of Hypothesis Testing

The structural model results provide evidence for both the direct and indirect relationships proposed herein. Market orientation has a positive and significant effect on product innovation (β = 0.304, p < 0.001), indicating that greater attention to customer needs, market information, and competitors is associated with stronger product innovation in SMEs. Market orientation also has a positive and significant relationship with SME performance (β = 0.231, p = 0.045), suggesting that market-oriented practices are directly associated with improved performance. Similarly, entrepreneurial orientation demonstrates positive and significant relationships with both product innovation (β = 0.373, p < 0.001) and SME performance (β = 0.334, p = 0.002). These findings indicate that proactive behavior, opportunity seeking, innovativeness, and willingness to take risks are associated not only with firms' capacity to develop products but also with their overall performance. Information technology utilization also shows a positive and significant relationship with product innovation (β = 0.267, p = 0.012), suggesting that the use of information technology can support firms in developing and

improving their products. However, its direct relationship with SME performance was negative and statistically significant ($\beta = -0.282$, $p = 0.031$). Thus, although information technology utilization is statistically related to SME performance, the observed direction is opposite to the positive direction proposed in this hypothesis. In contrast, product innovation has a positive and significant relationship with SME performance ($\beta = 0.553$, $p < 0.001$), indicating that product innovation is an important pathway through which SMEs can strengthen their performance.

The mediation results further demonstrate that product innovation plays an important intermediary role in the proposed model. Market orientation has a significant positive indirect effect on SME performance through product innovation ($\beta = 0.168$, $p = 0.005$), and entrepreneurial orientation also has a significant positive indirect effect through product innovation ($\beta = 0.207$, $p = 0.009$). In addition, information technology utilization has a significant positive indirect effect on SME performance through product innovation ($\beta = 0.148$, $p = 0.036$), despite its negative direct relationship with SME performance. Overall, these findings indicate that market orientation, entrepreneurial orientation, and information technology utilization are associated with SME performance, partly through their relationship with product innovation. The contrasting direct and indirect effects of information technology utilization are particularly noteworthy, suggesting that the contribution of technology to SME performance may depend on the firm's ability to translate technological resources into product innovation.

DISCUSSIONS

Market Orientation and Product Innovation

The results show that market orientation has a positive and significant relationship with product innovation ($\beta = 0.304$, $t = 3.703$, $p < 0.001$). This finding indicates that batik SMEs that pay closer attention to customers, monitor competitors, and exchange market information are more likely to develop and improve their products. This result is consistent with earlier empirical evidence reported in the study, particularly research showing that market orientation is positively associated with product innovation.

This finding is understandable in the context of Trusmi's batik industry, where product preferences can change relatively quickly, and firms operate alongside many businesses offering similar products. The descriptive results support this interpretation. Respondents reported relatively strong attention to reviewing products according to customer needs, while competitor-related information also formed part of their market-oriented activities. Simultaneously, the relatively low response concerning knowledge of competitors' weaknesses suggests that market orientation is not equally developed across all dimensions.

From a capability perspective, market information becomes valuable when it is translated into action. Customer information, for example, does not automatically constitute innovation. Its value emerges when business owners use this information to modify designs, colors, sizes, quality, or other product attributes. This interpretation is particularly relevant for batik SMEs because product differentiation can be achieved through relatively incremental changes rather than radical technological innovation.

Therefore, this finding supports the proposed framework, in which market orientation represents an organizational capability that provides information for product development. Rather than treating market orientation simply as a marketing activity, the result suggests that its contribution to innovation lies in the firm's ability to transform market knowledge into changes in its product offering.

These findings are consistent with the Resource-Based View (RBV), which recognizes market knowledge as a valuable organizational capability that can support product development. However, from the perspective of DCT, the value of this knowledge lies in how effectively firms apply it to adapt batik motifs, colors, designs, and quality to changing consumer preferences. Therefore, market orientation extends beyond collecting and analyzing market information; it also involves the ability to translate these insights into meaningful product improvements that respond to market demands.

Market Orientation and SME Performance

Market orientation was positively and significantly associated with SME performance ($\beta = 0.231$, $t = 2.034$, $p = 0.045$). Although the coefficient is smaller than that of market orientation on product innovation, the result indicates that market-oriented practices are directly associated with business performance.

This finding is consistent with prior studies that reported a positive market orientation–performance relationship, which reported positive relationships between market orientation and SME performance.

The results can be understood through the characteristics of the Trusmi batik market. Respondents indicated that they attempted to understand customer needs and maintain product quality, while some also monitored competitors' strategies. Such practices can strengthen a firm's ability to retain existing customers and respond

to changes in demand. The descriptive results show that reviewing products to ensure their alignment with customer needs received a relatively high mean score (3.765), while the item concerning responding to customer complaints also received a relatively favorable response.
However, the magnitude of the direct coefficient suggests that market orientation alone cannot fully explain performance. This is important for the broader argument of this study. Market knowledge may create value only when firms can convert it into products and market offerings that customers value. The significant indirect relationship through product innovation reinforces this interpretation.

Entrepreneurial Orientation and SME Performance
Entrepreneurial orientation had a positive and significant relationship with product innovation ($\beta = 0.373$, $t = 3.657$, $p < 0.001$). Among the three antecedent variables examined, entrepreneurial orientation had the largest direct coefficient on product innovation.
This result is consistent with previous studies that identified a positive relationship between entrepreneurial orientation and innovation.
The results are also reflected in the respondents' characteristics. The entrepreneurial orientation indicators generally recorded high mean values. In particular, the tendency to improve previously produced products recorded a mean of 4.078, while the ability to identify emerging opportunities recorded a mean of 4.039. Most respondents also agreed that they respond to new trends, anticipate future market needs, introduce new products, and improve existing products.
For batik SMEs, entrepreneurial orientation appears to operate through their willingness to experiment with product designs and respond to changing market preferences. Proactiveness encourages firms to respond before changes in demand become fully established, whereas innovativeness supports the development of new designs and improvements to existing products. Risk-taking provides the willingness to allocate resources to changes whose market response is uncertain.
These findings reinforce the argument that entrepreneurial orientation extends beyond individual entrepreneurial attitudes to function as an organizational capability, shaping how small firms identify opportunities and utilize limited resources for their product development. Of the three predictors examined, entrepreneurial orientation exhibited the strongest numerical relationship in the sample, with the highest coefficient for product innovation ($\beta = 0.373$, $p < 0.001$). From the DCT perspective, these findings emphasize the importance of proactive behavior, recognizing opportunities, and experimenting with products in response to changing market conditions. For batik SMEs, these capabilities can support the development of new designs and refinement of existing products in response to evolving consumer preferences. Further comparison with market orientation suggests that the willingness to act on emerging opportunities is particularly important for translating market conditions into product changes. However, larger coefficients merely indicate a stronger estimated relationship and do not prove that entrepreneurial orientation has a statistically stronger effect than the other predictors.

Information Technology Utilization and Product Innovation
Information technology utilization has a positive and significant relationship with product innovation ($\beta = 0.267$, $t = 2.548$, $p = 0.012$). This finding indicates that technology utilization is associated with firms' ability to develop and modify their products.
This result is consistent with previous research cited in this study, which suggests that information technology can support product innovation by improving access to information and enabling firms to respond to changing market conditions.
The descriptive results provide important context for this finding. Information technology was generally perceived positively by the respondents. The item concerning the ability of technology to make business activities easier recorded the highest mean among the IT utilization indicators (4.353), while the use of more than one application or software had a considerably lower mean (3.353).
This distinction suggests that technology utilization among the sampled SMEs may be more strongly associated with basic operational assistance and information access than with sophisticated digital transformation. Nevertheless, even relatively basic technology can provide information about customers, competitors, trends, and product preferences. This information can then be incorporated into decisions regarding batik motifs, designs, colors, and other product attributes.
These findings are consistent with the resource-based view (RBV), which emphasizes the strategic value of technological resources, and dynamic capabilities theory (DCT), which highlights organizational processes that translate these resources into valuable outcomes. For batik MSMEs, IT utilization can support product

innovation by providing access to information on market trends, facilitating communication with customers, and inspiring new designs. Therefore, the findings reinforce the idea that information technology is an enabler of innovation. However, the adoption of digital technologies should not be equated with the completion of digital transformation. Rather, the value of IT utilization depends on how effectively firms incorporate technological resources into their decision-making and product development activities.

Information Technology Utilisation and SME Performance: A Negative Direct Relationship

One of the most notable findings of this study is the negative and statistically significant relationship between IT utilization and SME performance ($\beta = -0.282$, $t = 2.182$, $p = 0.031$). This contradicts the positive relationship often reported in previous studies and challenges the assumption that a greater use of IT necessarily improves business performance.

However, this finding does not imply that IT is inherently detrimental to SME performance. Rather, within the present sample and model specification, higher reported IT utilization is associated with lower reported performance after accounting for market orientation, entrepreneurial orientation, and product innovation. Field observations and descriptive findings suggest that many batik SMEs in Trusmi continue to rely heavily on offline sales, with some businesses making limited use of social media for marketing purposes. Technology appears to be used primarily for communication, accessing customer information, and supporting routine business activities. While these contextual observations offer a possible explanation for the result, they do not establish the mechanism underlying the negative relationship.

A more comprehensive interpretation emerges when the direct and indirect effects of IT utilization are considered in conjunction with one another. While the direct effect on SME performance is negative and significant ($\beta = -0.282$, $p = 0.031$), the indirect effect via product innovation is positive and significant ($\beta = 0.148$, $p = 0.036$). These opposing patterns suggest inconsistent mediation, indicating that IT utilization is associated with SME performance differently depending on whether the relationship operates directly or through product innovation. From an RBV perspective, the findings suggest that possessing or utilizing technological resources does not guarantee superior performance. DCT offers a complementary explanation by highlighting the importance of organizational processes through which firms apply and transform these resources into market-relevant innovations. In the context of batik SMEs, technology may support access to market information and customer communication, but its contribution to performance may depend on whether these inputs are translated into valuable products. However, due to the cross-sectional design and relatively small sample size, the findings only establish statistical associations rather than definitive causal mechanisms.

Product Innovation and SME Performance

Product innovation has a positive and significant relationship with SME performance ($\beta = 0.553$, $t = 4.252$, $p < 0.001$). This was the strongest direct relationship among the principal structural paths in the model.

This result is consistent with earlier empirical studies cited in the research, which reported positive relationships between product innovation and SME performance.

This finding is particularly relevant to the competitive environment of Trusmi. The research setting included numerous batik businesses offering related products. Under such conditions, firms need to distinguish their offerings. The respondents reported relatively high levels of product-related activity, particularly in terms of product variety, size variation, pricing according to product characteristics, and distinctive designs.

The strong coefficient of product innovation suggests that product-related differentiation is closely associated with business performance. For traditional cultural industry SMEs, innovation does not necessarily require abandoning traditional identity. Instead, innovation can occur through modifications in design, color, product variety, quality, size, and presentation while retaining the underlying characteristics of batik.

The findings emphasize the importance of product innovation in translating internal organizational capabilities into valuable offerings for customers. The substantial effect size ($f^2 = 0.386$), which falls within the 'large effect' category under the classification adopted in this study, further emphasizes the importance of product innovation for SME performance. From the perspective of DCT, this result is consistent with the idea that organizational resources and capabilities generate value when firms effectively convert them into market-relevant products. In the context of batik MSMEs, this process involves translating market insights, entrepreneurial initiatives, and technological resources into products that respond to consumer preferences while maintaining distinctive characteristics. Therefore, product innovation represents more than just a product development outcome; it provides an important link between firms' internal capabilities and their

ability to deliver offerings that are valued by the market.

Product Innovation as a Mediating Mechanism

The mediation results provide the clearest evidence for the mechanisms proposed in this study. Product innovation significantly mediates the relationship between market orientation and SME performance (β = 0.168, p = 0.005), entrepreneurial orientation and SME performance (β = 0.207, p = 0.009), and information technology utilization and SME performance (β = 0.148, p = 0.036).

The first mediation pathway indicates that market information becomes more valuable when it is translated into product changes. A firm that understands customer preferences and competitor activities may improve its performance, but the effect is strengthened when such knowledge results in products that respond to those market conditions. The significant direct effect of market orientation on performance, alongside the significant indirect effect, suggests that product innovation represents one mechanism, rather than the only mechanism, through which market orientation is associated with performance.

The same pattern was observed for entrepreneurial orientation. Entrepreneurial behavior encourages firms to identify opportunities, anticipate demand, introduce new products, and improve existing offerings. These activities are directly related to performance and also contribute to performance through product innovation. The indirect coefficient of 0.207 was the largest among the three mediation pathways, indicating that product innovation is particularly relevant to the relationship between entrepreneurial orientation and SME performance in this sample.

The mediation result for information technology is more distinctive. IT utilization has a negative direct relationship with SME performance but a positive indirect relationship through product innovation. The resulting opposite-sign pattern indicates that the two pathways do not operate in the same direction as expected.

According to the results above, the findings highlight product innovation as a key mechanism through which market orientation, entrepreneurial orientation, and IT utilization influence SME performance. The significant indirect effects suggest that these capabilities contribute to business outcomes by enabling firms to develop and improve products in response to market demands. However, the relationship between IT utilization and performance requires a more nuanced interpretation. While there is a positive and significant indirect effect through product innovation (β = 0.148, p = 0.036), there is also a negative and significant direct effect on performance (β = −0.282, p = 0.031). These opposing signs indicate inconsistent mediation, whereby the direct and indirect effects operate in different directions. This suggests that, while product innovation is an important channel through which IT utilization is associated with performance, it does not fully account for the overall relationship between technology use and business outcomes. From the perspective of Dynamic Capabilities Theory (DCT), the results emphasise the importance of a firm's ability to convert technological resources into market-relevant innovations. They also indicate that the utilization of technology may have performance implications beyond this innovation pathway. Given the cross-sectional design, these relationships should be interpreted as statistical associations rather than definitive evidence of causal mechanisms.

Theoretical Integration: Resource-Based View and Dynamic Capabilities Theory

These findings provide an integrated perspective on SME performance by drawing on the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT). The RBV highlights the strategic value of a firm's resources and capabilities, while the DCT explains how firms mobilize and reconfigure these resources to produce outcomes that create value in the market. Empirical evidence shows that the contribution of strategic and technological capabilities to SME performance goes beyond their mere availability or utilization. Rather, the impact of these capabilities on performance also depends on how effectively firms translate them into product innovation.

From the perspective of the RBV, market orientation, entrepreneurial orientation, and IT use are strategically important organizational capabilities that can support business development. For batik MSMEs, market orientation helps companies understand customer preferences and monitor competitors, while entrepreneurial orientation encourages the identification of opportunities, proactive decision-making, and experimentation. The use of IT further strengthens these efforts by facilitating access to market information, communication with customers, and the coordination of business activities. Empirical results show a positive and statistically significant relationship between market orientation (β = 0.304, p < 0.001), entrepreneurial orientation (β = 0.373, p < 0.001), and IT utilization (β = 0.267, p = 0.012) and product innovation. These findings suggest that each capability contributes to a firm's ability to develop new products or improve

existing ones. This evidence is generally consistent with the RBV, which emphasizes the role of strategically relevant organizational resources in supporting competitive outcomes. However, these findings should not be interpreted as evidence that these capabilities independently generate sustainable competitive advantage, as this would require further evidence that the capabilities meet the key conditions of the RBV, including value, rarity, and non-imitatability.

The DCT complements this perspective by explaining how firms integrate, reconfigure, and deploy their resources to respond to ever-changing market conditions. In the context of this study, product innovation is the primary mechanism through which market knowledge, entrepreneurial initiatives, and technological resources are translated into product improvements and new offerings. The positive and statistically significant relationship between product innovation and SME performance ($\beta = 0.553$, $p < 0.001$), along with its substantial effect size ($f^2 = 0.386$), highlights the importance of this process in improving business outcomes. Furthermore, the significant indirect effects of market orientation ($\beta = 0.168$, $p = 0.005$), entrepreneurial orientation ($\beta = 0.207$, $p = 0.009$), and IT utilization ($\beta = 0.148$, $p = 0.036$) on SME performance through product innovation indicate that innovation serves as a key channel through which these capabilities contribute to firm performance. Overall, these findings suggest that possessing strategic and technological capabilities alone is not sufficient; their contribution to SME performance also depends on how effectively companies transform these capabilities into innovative products.

The findings further demonstrate that the effects of organizational capabilities on MSME performance differ across the dimensions examined. Market and entrepreneurial orientations both have positive and statistically significant direct effects on performance, with coefficients of 0.231 ($p = 0.045$) and 0.334 ($p = 0.002$), respectively. These results suggest that firms can benefit from understanding customer needs and proactively pursuing business opportunities not only through direct improvements in performance but also through product innovation. Notably, the indirect effect of entrepreneurial orientation ($\beta = 0.207$) exceeds that of market orientation ($\beta = 0.168$), indicating that product innovation may play a more prominent role in translating entrepreneurial initiatives into improved business outcomes than market orientation. Nevertheless, this difference reflects the estimated effect sizes and does not necessarily imply a statistically significant difference between the two indirect effects.

The relationship between IT utilization and SME performance offers an important theoretical contribution to the literature. While IT utilization positively influences product innovation, its direct effect on SME performance is negative and statistically significant ($\beta = -0.282$, $p = 0.031$). In contrast, its indirect effect on performance through product innovation was positive and significant ($\beta = 0.148$, $p = 0.036$). This opposing pattern indicates inconsistent mediation, suggesting that the relationship between IT utilization and business performance differs depending on whether its influence is direct or channelled through product innovation. From the RBV perspective, these findings challenge the assumption that technology adoption inherently improves firm performance. Instead, the benefits of technological resources depend on the effectiveness of their integration into business operations. From a DCT perspective, the results emphasize the importance of organizational processes that convert technological resources into innovative products that align with market needs. Although IT utilization can facilitate access to information and strengthen customer communication, these capabilities alone may not generate commercial value for a company. Their contribution to performance depends, in part, on the firm's ability to translate technological inputs into marketable innovations.

These findings demonstrate where businesses must preserve the cultural identity of traditional batik while responding to evolving consumer preferences and competitive pressures. Product innovation offers a means of balancing these priorities by adapting designs, colors, quality, product variety, and presentation to meet changing market demands without losing the distinctive character of traditional batik. However, the negative direct coefficient for IT utilization should not be interpreted as necessarily undermining business performance. Given the cross-sectional design and the relatively small sample of 51 MSMEs, the results reflect statistical associations within the firms examined rather than establishing a causal relationship between IT utilization and performance.

The integration of the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT) provides a more nuanced explanation of how organizational capabilities contribute to SME performance. The findings suggest that possessing or utilizing resources is only part of the equation; their contribution to performance also depends on how effectively firms convert them into commercially valuable outcomes. In this process, product innovation emerges as an important mechanism linking strategic orientation and IT utilization to business performance. Therefore, the contribution of this study lies in demonstrating that strategic and technological capabilities do not automatically translate into superior performance. Rather, their value is associated with how effectively firms apply these capabilities to develop products that respond to market

demands while maintaining the cultural identity of traditional industries. By examining these relationships in the context of batik MSMEs, this study also highlights the importance of understanding capability development and innovation within the specific commercial and cultural conditions in which traditional businesses operate.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Conclusion

Overall, the findings suggest that SME performance is shaped not only by the resources and orientations possessed by firms but also by how those resources are translated into marketable product innovations. Market orientation and entrepreneurial orientation are associated with both product innovation and SME performance, while information technology utilization shows a more complex pattern: its relationship with product innovation is positive, whereas its direct relationship with SME performance is negative. The positive indirect relationship through product innovation indicates that the business value of technology may depend on the firm's ability to integrate technological resources into innovation processes. This finding provides a basis for further investigation of how traditional SMEs in emerging economies can move from technology use to technology-enabled value creation.

Implication

This study provides empirical evidence on the distinct roles of strategic orientations, IT utilization, and product innovation in explaining SME performance, thereby contributing to the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT).

First, the findings reinforce the importance of market and entrepreneurial orientations as organizational capabilities linked to product innovation and SME performance. However, these results should be interpreted as evidence of the relationships between these capabilities and business outcomes rather than as direct proof that the capabilities independently generate sustained competitive advantage.

Second, the significant indirect effects of market orientation, entrepreneurial orientation, and IT utilization via product innovation emphasize the importance of the resource conversion process. In line with DCT, organizational capabilities become commercially relevant when they are utilized in processes that generate products that align with market requirements. Product innovation therefore provides an important explanatory mechanism connecting strategic and technological capabilities with SME performance.

Third, the inconsistent mediation pattern observed for IT utilization provides a more refined theoretical explanation of technology-related performance. The negative direct relationship between IT utilization and SME performance, alongside the positive indirect relationship involving product innovation, suggests that IT utilization and technology-enabled value creation are not equivalent concepts. This finding emphasizes the importance of examining organizational processes that convert technological resources into market-valued offerings.

In the context of traditional batik SMEs, the integrated resource-based view (RBV) and dynamic capabilities theory (DCT) perspective provide a more differentiated explanation of competitiveness. While market knowledge, entrepreneurial initiative, and technological resources are relevant to product development, their performance implications depend partly on how firms translate these capabilities into product innovation while maintaining the cultural identity of their products. Consequently, this study extends the discussion of resource utilization and innovation-mediated performance to a traditional cultural industry setting in an emerging economy.

Contextual Contribution to the Batik SME Literature

The findings also extend the discussion of SME innovation to a traditional cultural-industry setting. Much of the discussion surrounding digitalization and SME competitiveness tends to assume that technology adoption represents progress toward better performance. The present findings provide a more differentiated empirical picture.

Trusmi batik SMEs operate in a context where traditional product identity, customer preferences, competition, and changing market trends coexist. Product innovation represents a practical bridge between maintaining the characteristics of batik products and responding to contemporary market requirements.

The results indicate that firms with stronger market and entrepreneurial orientations tend to report greater product innovation, and technology utilization is also positively associated with product innovation. However, the direct relationship between IT utilization and performance was negative. This suggests that the strategic question for these SMEs is not simply whether technology is being used but how technology is integrated into activities that create customer value and strengthen product offerings.

Suggestions

Building on these limitations and the study's findings, several directions for future research and practice can be proposed. Future studies could extend the proposed model to batik SME clusters in other regions of Indonesia or to other traditional cultural-craft industries to examine whether the value-conversion role of product innovation and the inconsistent mediation pattern of IT utilization observed in Trusmi hold in different contexts. A longitudinal research design is also recommended to trace how market orientation, entrepreneurial orientation, and IT utilization are converted into product innovation and performance over time, particularly given that the benefits of technology adoption in traditional, culturally embedded industries may not materialize immediately. Given that the present findings show that technology utilization contributes positively to performance only indirectly through product innovation, further research is suggested to investigate the specific organizational and complementary capabilities that enable batik SME actors to move from technology use toward technology-enabled value creation, as well as how IT can be more deliberately integrated into customer value-creation processes rather than adopted as a standalone resource. Finally, future studies may consider complementing self-reported perceptual measures with objective secondary data (e.g., sales or financial records) to strengthen the robustness of the performance construct.

Limitations

This study has several limitations that should be acknowledged. First, the sample was drawn using a census (saturated sampling) approach covering all 51 registered batik SMEs in Trusmi Village, Plered District, Cirebon Regency. While this fully captures the identified population in the research location, the relatively small and geographically concentrated sample limits the generalizability of the findings to batik SMEs in other regions or to other cultural craft industries. Second, all constructs (market orientation, entrepreneurial orientation, IT utilization, product innovation, and SME performance) were measured through respondents' self-reported perceptions via a structured questionnaire, which may be subject to perceptual bias or social desirability rather than objective business records.

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