

Innovation, Strategic Planning, and Technology Adoption as Drivers of SMEs' Performance

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Abstract

Small and Medium Enterprises (SMEs) play a pivotal role in driving economic growth and employment, particularly in emerging economies. However, their performance is often constrained by limited resources, weak strategic alignment, and insufficient technological integration. Grounded in the Resource-Based View (RBV) and Dynamic Capabilities framework, this study examines the influence of innovation, strategic planning, and technology adoption on SMEs' performance. Data were collected from 100 SME respondents in Indonesia using purposive sampling, and the analysis was conducted through Structural Equation Modeling (SEM) with SmartPLS 3.0. The findings demonstrate that strategic planning significantly enhances SMEs' performance by improving internal alignment and market responsiveness. Innovation, while essential, shows inconsistent effects, as its benefits depend on managerial capability and resource readiness. Moreover, technology adoption emerges as a critical factor, strengthening the positive impact of strategic planning and mitigating the risks of poorly managed innovation. The results highlight that SMEs must balance innovation efforts with systematic planning while integrating technology to ensure sustainable competitiveness. This study contributes theoretically by advancing the integration of RBV and Dynamic Capabilities in SME performance research, and it provides practical insights for managers and policymakers to foster digital readiness, strategic orientation, and innovation driven growth.

Keywords: innovation, strategic planning, technology adoption, SMEs performance.

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INTRODUCTION

In the contemporary digital economy, Micro, Small, and Medium Enterprises (MSMEs) serve as pivotal drivers of national economic growth and employment generation. Empirical evidence indicates that the contribution of MSMEs to Indonesia's GDP and labor absorption has experienced consistent and substantial growth; however, their overall productivity and innovation capacity remain comparatively low relative to other Southeast Asian economies (Purnomo et al., 2024). This performance gap underscores the need for more systematic and empirically grounded investigations into the determinants of MSME competitiveness, particularly within the domains of strategic management and digital transformation.

Grounded in the Resource Based View (RBV) and Dynamic Capabilities frameworks, an organization's ability to adapt to environmental shifts through data-driven strategic planning and continuous innovation is widely recognized as a central determinant of sustainable competitive advantage (Desalegn et al., 2024; Sun et al., 2024). Nevertheless, empirical findings in the Indonesian context reveal that innovation, while essential, is often insufficient to enhance performance when constrained by limited capital, inadequate human resource capabilities, and an underdeveloped business ecosystem (Suardana et al., 2025). By contrast, well-formulated strategic planning has demonstrated the capacity to improve business outcomes through internal alignment and proactive risk management; yet its implementation remains suboptimal due to limited planning competencies and the absence of systematic execution mechanisms (Holm et al., 2025).

Digital technology adoption including e-commerce platforms, information systems, and business analytics has been shown to reinforce the effectiveness of both innovation and strategic planning by providing operational frameworks that enhance efficiency, expand market reach, and improve service quality (Hendrawan et al., 2024; Triwahyono et al., 2023). However, these benefits are not automatic (Song et al., 2025); rather, their realization depends critically on organizational readiness (Sharma & Venkatraman, 2023), the digital literacy of business owners, and supportive external factors such as government policy and market dynamics (Raharjo et al., 2024; Zhou & Zheng, 2023). While strategic planning generally exerts a positive influence on MSME performance, innovation can produce negative effects if poorly managed (Lestari et al., 2024). Prior research suggests that technology adoption can moderate these relationships by amplifying the positive effects of strategic planning and mitigating the potential downsides of innovation (Lestari et al., 2024). When effectively integrated, digital solutions such as



Enterprise Resource Planning (ERP) systems can strengthen competitiveness and sustainability through improved resource management and operational efficiency (Mogrovejo et al., 2020).. Conversely, inappropriate implementation may erode these benefits, introducing inefficiencies and undermining competitive advantage (Chiu & Yang, 2019). This highlights the critical role of well-managed technology adoption in unlocking the full potential of innovation and strategic planning within MSMEs.

THEORY AND HYPOTHESIS DEVELOPMENT

Resources Based View

The Resource Based View posits that a firm's sustainable competitive advantage is derived from the possession and effective utilization of valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991). In the MSME context, these resources encompass tangible assets (e.g., capital, technology) and intangible assets (e.g., managerial capabilities, innovation capacity, brand reputation) (Hidayat & Pok, 2025). RBV emphasizes that strategic planning and innovation can transform these resources into superior performance outcomes when aligned with organizational goals and market demands. However, resource constraints common in MSMEs necessitate efficient allocation and utilization to prevent innovation from generating operational inefficiencies or misaligned market offerings (Supriadi et al., 2023).

Dynamic Capabilities Theory

Dynamic Capabilities Theory (Teece, 2023) extends RBV by focusing on a firm's ability to integrate, build, and reconfigure internal and external competences in response to rapid environmental changes. For MSMEs, dynamic capabilities manifest in the capacity to continuously adapt strategies, adopt emerging technologies, and innovate processes or products to sustain competitiveness (Held et al., 2025). Strategic planning provides a structured approach to scanning the environment, identifying opportunities, and aligning resources, while technology adoption enables rapid reconfiguration of operational models to exploit these opportunities. This theoretical perspective explains how MSMEs can leverage technology adoption as a moderating mechanism to enhance the performance impact of innovation and strategic planning (Loo et al., 2023).

Innovation

Innovation refers to the implementation of new ideas, processes, products, services, or business models aimed at creating added value and enhancing a firm's



competitiveness (Suardana et al., 2025). In the MSME context, innovation encompasses product renewal, improvements in production methods, innovative marketing strategies, and organizational process redesign to deliver competitive advantage, provided that such initiatives are aligned with market needs and resource capabilities. Indicators:

IN1: Introduction of new products or services.

IN2: Implementation of new or improved production methods.

IN3: Utilization of innovative marketing strategies.

IN4: Organizational process changes to enhance efficiency.

IN5: Adoption of new business models relevant to the market.

Strategic Planning

Strategic planning is a systematic process of establishing a vision, mission, goals, and strategic actions based on an analysis of internal and external environments (David, 2016). For MSMEs, strategic planning serves as a guideline to maximize resource utilization, anticipate risks, and ensure the sustainable achievement of business objectives.

Indicators:

SP1: Establishment of clear and measurable goals.

SP2: Alignment of organizational policies with strategic objectives.

SP3: Integration of internal and external environmental analysis into decision-making.

SP4: Allocation of resources in line with strategic priorities.

SP5: Periodic review and adjustment of strategies according to market changes.

Technology Adoption (TA)

Technology adoption refers to the process of accepting, integrating, and utilizing new technologies in business operations to enhance efficiency, expand market reach, and create added value (Lumenalta, 2024). In MSMEs, technology adoption includes the ability to implement digital systems such as e-commerce platforms, ERP systems, and business analytics, supported by adequate human resource readiness to operate such technologies effectively.

Indicators:

TA1: Utilization of technology to improve operational efficiency.

TA2: Integration of digital tools into core business processes.

TA3: Use of technology to expand market reach.



TA4: Adaptability in learning and applying new technologies.

TA5: Enhancement of customer service through technology.

TA6: Use of technology for data-driven decision-making.

SMEs Performance

SMEs performance is the degree to which business objectives are achieved, measured through both financial and non-financial indicators, including revenue growth, profitability, customer satisfaction, and operational efficiency (Srinivasarao et al., 2020). It reflects the effectiveness of resource utilization and the firm's adaptability to market dynamics.

Indicators:

SF1: Growth in sales revenue.

SF2: Increase in the customer base.

SF3: Improvement in operational efficiency.

SF4: Profitability growth.

SF5: Expansion of market share.

SF6: Customer satisfaction levels.

SF7: Achievement of organizational objectives.

Hypothesis And Conceptual Framework

The conceptual framework in this study is as follows.

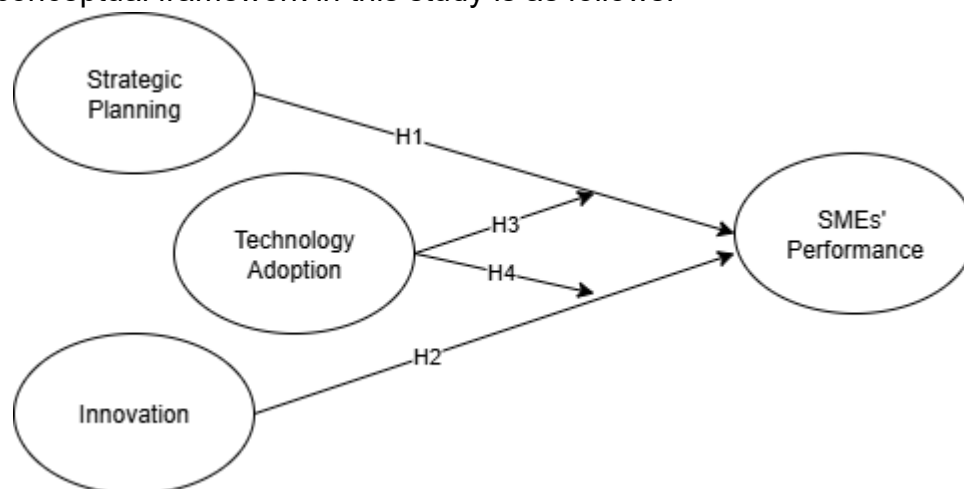


Figure 1. Conceptual Framework

Strategic planning is recognized as a critical managerial process that allows firms to align their internal resources with external opportunities and threats, thereby enhancing competitiveness and performance outcomes. For MSMEs, strategic planning provides a structured approach to set measurable objectives, allocate scarce resources efficiently, and anticipate market risks (Donkor et al., 2018). Empirical findings further confirm that strategic planning exerts a significant positive influence on MSME performance by fostering organizational alignment and guiding decision-making under uncertainty (Arsawan et al., 2023). Studies across different contexts, including Indonesia, Malaysia, and Ghana, consistently highlight that systematic strategic planning improves financial results, operational efficiency, and overall business sustainability (Kafidi & Kaulihowa, 2023).

H1 : Strategic planning affects SME performance.

Innovation is widely acknowledged as a key driver of competitiveness and growth, as it enables firms to differentiate their products, improve processes, and adapt to changing market dynamics. In the SME context, innovation encompasses the introduction of new products or services, improvements in production processes, and the development of novel business models that enhance value creation (Gavrila & Ancillo, 2021). Empirical research in Indonesia and other emerging economies suggests that innovation positively contributes to SMEs' performance by fostering market responsiveness, increasing customer satisfaction, and supporting long-term sustainability (Fitriati et al., 2020).

H2 : Innovation affects SMEs' performance.

Strategic planning provides SMEs with a structured approach to allocate resources, analyze environmental dynamics, and establish long-term objectives that guide organizational actions. Prior research has consistently shown that strategic planning improves SMEs' performance by fostering internal alignment, enhancing decision-making quality, and mitigating risks (Arsawan et al., 2023; Donkor et al., 2018). However, the extent to which strategic planning translates into superior performance often depends on the organizational environment and the supporting mechanisms available. Technology adoption serves as a critical moderating factor in this relationship. When SMEs integrate digital tools such as e-commerce platforms, enterprise resource planning (ERP) systems, and business analytics, strategic planning becomes more data-driven, precise, and adaptive to market fluctuations. Empirical evidence suggests that technology adoption strengthens the positive impact of strategic planning by enhancing



operational efficiency, enabling real-time decision-making, and expanding market opportunities (Lestari et al., 2024).

H3: Technology adoption moderates the relationship between strategic planning and SMEs' performance

Innovation is a critical factor for SMEs as it enables firms to introduce new products, improve processes, and respond to dynamic customer needs, thereby enhancing competitiveness and long-term survival (Fitriati et al., 2020; Gavrilă & Ancillo, 2021). Empirical studies demonstrate that innovative SMEs are more likely to achieve superior performance outcomes by differentiating themselves in competitive markets and aligning offerings with consumer demands (Sari et al., 2023). However, the impact of innovation on performance is not always straightforward. Some studies report that innovation may have no significant effect, or even a negative influence, when firms face resource limitations, weak managerial capabilities, or misalignment between innovation efforts and market requirements (Lestari et al., 2024). In such cases, innovation can increase costs and operational complexity without yielding proportional returns.

Technology adoption emerges as a decisive moderating factor in this relationship. By integrating digital technologies such as e-commerce, enterprise resource planning (ERP), and business analytics SMEs can transform innovative ideas into scalable, efficient, and market-oriented outcomes. Technology enables the optimization of innovation processes by providing better data management, reducing inefficiencies, and expanding market reach. Prior research highlights that technology adoption can mitigate the potential negative effects of innovation while amplifying its positive contributions to firm performance (Lestari et al., 2024).

H4: Technology adoption moderates the relationship between innovation and SMEs' performance

RESEARCH METHOD

This study adopts a quantitative design to analyze the relationships among innovation, strategic planning, technology adoption, and SMEs' performance. The sample size of 100 respondents was determined based on Paul Leedy's (1997) guideline, which considers this number sufficient for multivariate analysis using SEM. Respondents consisted of SME owners and managers selected through purposive sampling. Data were collected using structured questionnaires with indicators adapted from prior studies and measured on a five-point Likert scale.



Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0. This method was chosen for its suitability in handling complex models with relatively small sample sizes (Hair et al., 2018). The analysis involved two stages: evaluating the measurement model (validity and reliability) and testing the structural model, including the moderating role of technology adoption, using bootstrapping procedures.

RESULT AND DISCUSSION

Outer Model Results

The measurement model was assessed to verify indicator reliability, internal consistency, and construct validity. All indicators demonstrated outer loadings above 0.70, indicating satisfactory reliability. Cronbach's Alpha and Composite Reliability (CR) values for all constructs were greater than 0.70, confirming internal consistency. Similarly, Average Variance Extracted (AVE) values exceeded 0.50, ensuring convergent validity (Ghozali, 2014).

Tabel 1. Summary of Measurement Model Results

Construct	Indicator Range (Loading)	Cronbach's Alpha	Composite Reliability (CR)	AVE	Remarks
Innovation (IN)	0.844 – 0.906	0.923	0.942	0.763	Reliable and Valid
Strategic Planning (PR)	0.860 – 0.924	0.943	0.956	0.814	Reliable and Valid
Technology Adoption (TA)	0.884 – 0.925	0.953	0.962	0.809	Reliable and Valid
SMEs' Performance (PR)	0.814 – 0.918	0.956	0.964	0.793	Reliable and Valid

Source : Researcher processed data, 2025



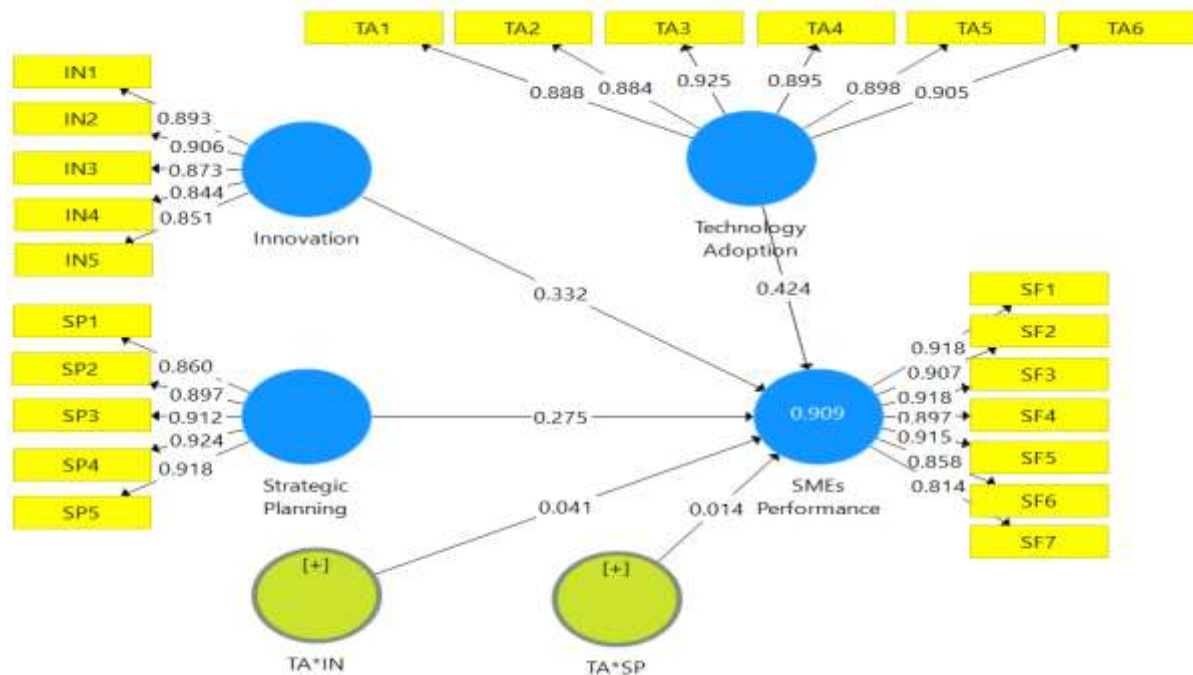


Figure 1. Outer Model

The Hypothesis Testing Process

The structural model results demonstrate that innovation exerts a significant positive effect on SMEs' performance ($\beta = 0.332$; $t = 4.206$; $p < 0.001$), suggesting that innovative practices contribute directly to improved business outcomes. Similarly, strategic planning positively and significantly influences SMEs' performance ($\beta = 0.275$; $t = 2.955$; $p = 0.003$), confirming that systematic planning enhances organizational alignment and competitiveness. Furthermore, technology adoption shows the strongest direct effect on performance ($\beta = 0.424$; $t = 3.858$; $p < 0.001$), indicating that effective utilization of digital tools substantially improves efficiency and market responsiveness. However, the hypothesized moderating effects of technology adoption on the relationships between innovation and strategic planning with SMEs' performance were statistically insignificant ($p = 0.640$ and $p = 0.877$, respectively). This implies that while technology adoption is a critical driver of performance in its own right, it does not strengthen or alter the effects of innovation and strategic planning when acting as a moderator within this model.

Recommendation model

Based on the research findings, technology adoption did not demonstrate a significant moderating effect. Consequently, this study proposes a recommendation model in which technology adoption is repositioned as an intervening variable, mediating the relationship between innovation, strategic planning, and SMEs' performance. The proposed model is illustrated as follows.

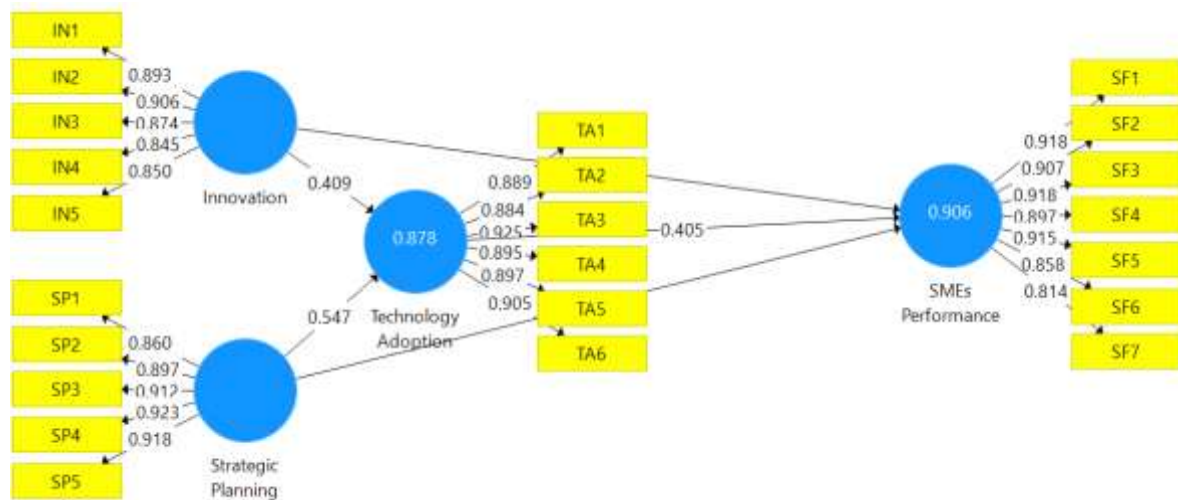


Figure 2. Recommendation Model

From the proposed recommendation model, two R-square values were obtained, namely for technology adoption and SMEs' performance. These R-square values indicate the explanatory power of the model in predicting variance in each endogenous construct. To further assess the overall predictive relevance of the model, the Q² (Stone–Geisser's Q²) calculation was employed, providing an evaluation of the model's total predictive capability.

$$\begin{aligned}
 Q^2 &= 1 - (1-R1^2)(1-R2^2) \\
 &= 1 - (1-0.878)(1-0.906) \\
 &= 0.9885 \text{ (98.85\%)}
 \end{aligned}$$

The Q² value obtained is 0.9885 (98.85%), which demonstrates an exceptionally high predictive relevance of the model. According to Hair et al. (2021), values of Q² greater than zero confirm that the model possesses predictive validity, and a value approaching 1 indicates very strong predictive capability. Therefore, this result confirms

that the proposed model has substantial predictive power in explaining both technology adoption and SMEs' performance.

Before presenting the results, it is essential to provide an overview of the hypothesis testing process. The analysis was conducted using the recommended model, which incorporates technology adoption as a mediating variable. The results summarize the path coefficients, t-statistics, and significance values to evaluate the proposed hypotheses. The detailed findings are presented in the following table.

Tabel 2. Direct and Indirect Effect

	Original Sampel (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic (O/STDEV)	P Values
IN → TA	0.409	0.412	0.074	5.560	0.000
SP → TA	0.547	0.544	0.072	7.573	0.000
TA → SF	0.405	0.411	0.111	3.632	0.000
IN → SF	0.321	0.319	0.084	3.828	0.000
SP → SF	0.253	0.249	0.091	2.774	0.006
IN → TA → SF	0.166	0.172	0.062	2.662	0.008
SP → TA → SF	0.222	0.222	0.062	3.600	0.000

Source : Researcher processed data, 2025

Following the hypothesis testing of the recommended model, the findings reveal that technology adoption functions as an intervening variable. This indicates that the effect of innovation and strategic planning on SMEs' performance is not merely direct, but is also transmitted through technology adoption as a mediating mechanism, thereby reinforcing its critical role in enhancing business outcomes.

CONCLUSION

This study examined the relationship between innovation, strategic planning, technology adoption, and SMEs' performance within the framework of the Resource-Based View (RBV) and Dynamic Capabilities. The findings demonstrate that while innovation and strategic planning significantly influence SMEs' performance, their effects are more substantial when mediated by technology adoption. The results further reveal that technology adoption does not act as a moderator but rather functions as an



intervening variable, underscoring its critical role in transforming managerial practices into tangible performance outcomes.

From a theoretical perspective, the study enriches RBV and Dynamic Capabilities theory by positioning technology adoption as a mediating mechanism that links organizational resources and dynamic processes with sustainable performance. Practically, the findings emphasize the importance for SMEs to strategically integrate digital technologies such as e-commerce platforms, ERP systems, and business analytics to fully realize the benefits of innovation and planning. Overall, the study highlights that the pathway to improved SMEs' performance lies not only in fostering innovation and robust strategic planning but also in ensuring the effective adoption and integration of technology as a driver of competitiveness and long-term sustainability.

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