

Unpacking the Digital Edge: How Digital Transformation Drives Business Model Innovation and Performance in Jakarta's Digital Food SMEs

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Abstract. The objectives of this study is to analyze the effect of digital transformation on SME performance, the effect of digital transformation on business model innovation, the effect of business model innovation on SME performance, and the effect of digital transformation on SME performance mediated by business model innovation. This study us a quantitative research design, the study utilizes Partial Least Squares (PLS) to examine data from 150 purposively selected digital-based food SME owners aged 45 and above. The study instrument comprises reflective constructs measured via Likert scales, and data analysis is conducted using SmartPLS software. The study results indicate digital transformation significantly improves SME performance both directly and indirectly through BMI. Furthermore, BMI emerges as a strategic conduit through which digital tools are transformed into operational and market advantages. These study results highlight the importance of aligning digital investments with innovative business models to achieve sustainable performance improvements. The study provides practical implications for SME managers and policymakers, urging the integration of digital capability development with strategic business model transformation. This study contributes theoretically by validating a structural mediation model and empirically by contextualizing digital transformation in Southeast Asian SME ecosystems.

Key words: Digital Transformation, Business Model Innovation, SME Performance, Food Industry, Digital SME

Introduction

In the post-COVID-19 era, digital transformation has shifted from being a competitive advantage to an operational necessity, especially for small and medium-sized enterprises (SMEs) in densely populated cities like Jakarta. Consumer preferences have rapidly evolved, embracing online ordering, digital payments, and e-commerce as integral to daily life (Nugroho et al., 2023). For food-sector SMEs, adopting these technologies is no longer optional but essential to ensure continuity and market relevance (Nugroho et al, 2023).

However, despite widespread digital adoption, many culinary SMEs in Jakarta fail to achieve proportional gains in performance. The core issue lies in the misalignment between technological deployment and business strategy. Without embedding digital tools into the firm's core logic and operational models, technology becomes a superficial layer rather than a transformative force (Supramono et al, 2024). This mismatch highlights that digital adoption alone does not translate into improved outcomes in profitability, customer satisfaction, or market reach.

The Indonesian government has launched ambitious initiatives to onboard over 30 million SMEs into the digital economy by 2023. While this has accelerated digital adoption, many SMEs still face barriers such as low digital literacy, weak organizational capacity, and fragmented digital strategies (Anatan & Nur, 2023) (Varona et al, 2024). These constraints contribute to a fragmented digital transformation landscape, where adoption is not necessarily followed by effective integration or sustainable impact.

These realities underscore a pressing research problem: understanding not only the extent of digital transformation in Jakarta's food SMEs, but how and under what conditions such transformation contributes to business performance. The study addresses this by investigating business model innovation (BMI) as the key mechanism that converts digital efforts into tangible outcomes.

Despite the rapid spread of digital platforms—ranging from e-menus to mobile payment and social media commerce—performance improvements remain inconsistent. SMEs often adopt digital tools reactively, under market pressure, without strategic planning or alignment with their business model (Rodrigáñez et al, 2024). This reactive behavior leads to fragmented outcomes and inefficiencies. Prior evidence suggests that digital investments, unless accompanied by strategic redesign of the business model—particularly value propositions, revenue channels, and delivery mechanisms—often underperform (Prihandono et al, 2023) (Elia et al, 2024).

While the individual impacts of digital transformation and BMI have been widely discussed, their combined influence—particularly in emerging economies—remains underexplored. Merín Rodrigáñez et al. (2024) found partial mediation of BMI in Spanish SMEs, but little is known about whether similar mechanisms apply in Southeast Asia, especially within the Indonesian food sector. Likewise, Prihandono et al. (2023) emphasize digital strategy's role but do not test BMI's mediating influence. Liu et al. (2024) highlight BMI's role in Chinese SMEs, linking it to dynamic capabilities, yet Jakarta's food SMEs present distinct contextual dynamics not addressed in prior studies.

This study's key contribution lies in developing and validating an integrated model that links digital transformation, business model innovation (BMI), and SME performance. While earlier studies from Latin America and China highlight BMI's mediating role (Rodrigáñez et al, 2024) (Liu et al, 2024), empirical study in Southeast Asia—particularly Jakarta—remains scarce. By filling this gap, the study offers valuable insights into how digital adoption translates into performance gains through strategic innovation.

Two elements distinguish this study. First, it focuses on Jakarta's food-sector SMEs, a digitally evolving yet underexplored context. Second, it empirically tests BMI as a mediator, demonstrating that digital tools alone are insufficient without business model adaptation. This underscores the importance of rethinking how value is created, delivered, and captured in the digital era.

Guided by this rationale, the study formulates four objectives to: (1) evaluate the effect of digital transformation on SME performance; (2) assess the influence of digital transformation on BMI; (3) analyze the impact of BMI on SME performance; and (4) test the mediating role of BMI in the relationship between digital transformation and performance. By addressing these objectives, the study aims to deliver actionable insights for enhancing the strategic resilience and competitiveness of SMEs in Jakarta's rapidly evolving economy.

Methods

This study targeted digital food SME owners in Jakarta, Indonesia, using purposive sampling to ensure alignment with research objectives. Respondents were digital food entrepreneurs aged 45 and above, based on demographic data indicating that over 55% of such SME owners fall within this age range (BPS DKI Jakarta, 2023). A total of 150 valid responses were collected, surpassing the minimum PLS-SEM threshold of 100 (Hair et al., 2022). All constructs—digital transformation, business model innovation (BMI), and SME performance—were modeled reflectively and measured using validated five-point Likert scales adapted from Merín Rodrigáñez et al. (2024). The instrument was administered online and pre-tested for clarity and reliability.

Measurement model quality was ensured by assessing convergent validity (outer loadings > 0.70, AVE > 0.50), discriminant validity (via Fornell-Larcker criterion), and internal consistency reliability (Cronbach's Alpha and Composite Reliability \geq 0.70). Model fit was evaluated using SRMR (< 0.10), NFI (close to 1), and RMS Theta (< 0.12), confirming structural adequacy (Hair et al., 2022).

The structural model was tested using bootstrapping to estimate path significance. R-square values assessed explanatory power, while effect sizes (f^2) gauged individual variable contributions. Predictive relevance (Q^2) was confirmed via blindfolding, with Q^2 values above zero indicating strong model prediction. By adhering to rigorous SEM protocols, this study offers valid empirical insights into how digital transformation and BMI jointly influence the performance of digital food SMEs in Jakarta.

Results and Discussion

Evaluation of the Outer Model

Table 1. Outer Model Validity and Reliability

Construct	Outer Loading ($> 0,7$)	AVE ($> 0,5$)	Cronbach's Alpha ($> 0,7$)	Composite Reliability ($> 0,7$)
Business Model Innovation (BMI)	0.84	0.70	0.93	0.94
Digital Transformation (DT)	0.86	0.75	0.91	0.94
SME Performance (SMEPF)	0.90	0.81	0.92	0.95

All indicator loadings for Digital Transformation (DT), Business Model Innovation (BMI), and SME Performance (SMEPF) exceeded 0.70, and AVE values were above 0.50, confirming strong convergent validity. Reliability, assessed via Cronbach's Alpha and Composite Reliability (CR), also exceeded 0.70 for all constructs, indicating solid internal consistency and measurement reliability.

Table 2. Outer Model Discriminant Validity

Construct	Business Model Innovation (BMI)	Digital Transformation (DT)	SME Performance (SMEPF)
Business Model Innovation (BMI)	0.84	0.62	0.53
Digital Transformation (DT)	0.62	0.86	0.66
SME Performance (SMEPF)	0.53	0.66	0.90

Discriminant validity was evaluated using the Fornell-Larcker criterion, which is satisfied when the square root of a construct's AVE exceeds its correlations with other constructs. As shown in the Fornell-Larcker matrix, the diagonal AVE values are higher than all inter-construct correlations, confirming that each construct is empirically distinct.

Table 3. Cross-loadings Outputs

Indicator (Item)	Business Model Innovation (BMI)	Digital Transformation (DT)	SME Performance (SMEPF)
BMI1	0.85	0.55	0.45
BMI2	0.88	0.52	0.39
BMI3	0.85	0.51	0.47
BMI4	0.87	0.55	0.52
BMI5	0.82	0.49	0.45
BMI6	0.82	0.49	0.36
BMI7	0.77	0.50	0.44
DT1	0.54	0.87	0.52
DT2	0.58	0.89	0.62
DT3	0.51	0.89	0.64
DT4	0.52	0.80	0.45
DT5	0.50	0.87	0.59
SMEPF1	0.42	0.57	0.89
SMEPF2	0.51	0.59	0.92
SMEPF3	0.50	0.62	0.92
SMEPF4	0.48	0.60	0.88

Cross-loading analysis confirms that each indicator loads more strongly on its intended construct than on any other, demonstrating clear construct distinctiveness. The results show that all items exhibit higher loadings on their respective latent variables, reinforcing both conceptual clarity and discriminant validity.

Evaluation of the Inner Model

R-Square Evaluation

Table 4. R-Square Outputs

Endogenous Construct	R Square Score	Interpretation
Business Model Innovation (BMI)	0.38	Moderate
SME Performance (SMEPF)	0.46	Moderate

The R² for BMI is 0.38 and for SME Performance (SMEPF) is 0.46, both suggesting moderate explanatory strength. These outputs indicate that Digital Transformation (DT) significantly explains variance in BMI, and that both DT and BMI collectively account for a meaningful portion of the variance in SMEPF. Overall, the structural model demonstrates reasonable robustness and explanatory relevance.

Effect Size Evaluation

Table 5. Effect Sizes Outputs

Path	f ² Score	Interpretation
Digital Transformation (DT) → SME Performance (SMEPF)	0.33	Medium
Digital Transformation (DT) → Business Model Innovation (BMI)	0.61	Large
Business Model Innovation (BMI) → SME Performance (SMEPF)	0.05	Small

The f² for DT → SMEPF exceeds 0.15, indicating a moderate influence of digital transformation on SME performance. The f² for DT → BMI surpasses 0.35, reflecting a strong effect of digital transformation on business model innovation. Meanwhile, BMI → SMEPF has an f² around 0.05, suggesting a small yet meaningful effect—particularly relevant in its mediating role between digital transformation and performance outcomes.

Predictive Relevance Evaluation

Table 6. Predictive Relevance Outputs

Endogenous Construct	Q ² Score	Interpretation
Business Model Innovation (BMI)	0.25	Strong
SME Performance (SMEPF)	0.36	Strong

A Q² of 0.25 for BMI suggests strong predictive relevance of Digital Transformation on BMI, while a Q² of 0.36 for SME performance confirms substantial predictive accuracy of the model in explaining performance outcomes through Digital Transformation and BMI.

Model Fit Indices Evaluation

Table 7. Model Fit Indices Outputs

Fit Index	Score	Interpretation
SRMR	0.06	Good Fit
NFI	0.84	Acceptable Fit

SRMR and NFI addressed for assessing structural model fit. The SRMR score < 0.08 and NFI score close 1 denotes good model fit. The SRMR score of 0.06 and NFI score of 0.84 interpreted structural model studied have a good model fit.

Hypothesis Testing

Table 8. Hypothesis Testing Outputs

Hypothesis	Path	Path coefficients	p-value	Conclusion
H1	Digital Transformation (DT) → SME Performance (SMEPF)	0.54	0.00	Supported
H2	Digital Transformation (DT) → Business Model Innovation (BMI)	0.62	0.00	Supported
H3	Business Model Innovation (BMI) → SME Performance (SMEPF)	0.20	0.02	Supported
H4	Digital Transformation (DT) --> Business Model Innovation (BMI) --> SME Performance (SMEPF)	0.12	0.04	Supported

Hypothesis 1 (H1) confirms digital transformation positively significant impact on SME performance. This outcome aligns with the view digital technologies—such as online platforms and digital payment systems—enable firms to operate more efficiently, respond faster to customer needs, and stay competitive in increasingly digital markets (Carmo et al, 2025) (Barragan et al, 2023) (O'Higgins, 2023) (Ojukwu et al, 2024) (Surahman et al, 2023) (Tian et al, 2023).

Hypothesis 2 (H2) confirms digital transformation positively significant impact on BMI. This supports prior evidence that digitization facilitates experimentation, platform adoption, and service modularity—key precursors of business model transformation (Ancillai et al, 2023) (Fang et al, 2024) (Liu et al, 2024) (Ramadan et al, 2023) (Tetteh et al, 2025).

Hypothesis 3 (H3) confirms BMI positively significant impact on SME performance. This is consistent with some previous study have found that innovation in revenue logic, cost structure, and customer interface can significantly improve firm outcomes—particularly when embedded within digital transformation initiatives (Keiningham et al, 2020) (Latifi et al, 2021) (Menter et al, 2023) (Salfore et al, 2023) (Dung & Dung, 2024) (Wang & Zhang, 2025).

Hypothesis 4 (H4) confirms that BMI serves as a partial conduit translating digital capabilities into performance outcomes. This result supports emerging scholarship emphasizing the mediating role of strategic configuration in digital ecosystems (Liu et al, 2024) (Boonlua et al, 2023).

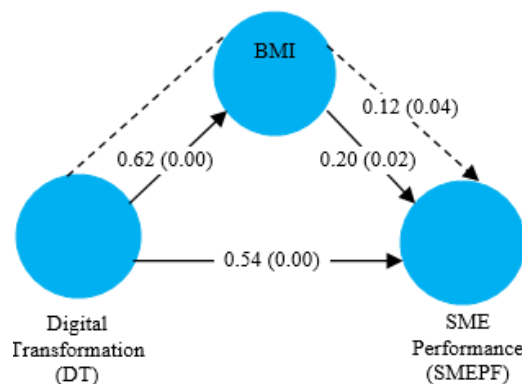


Figure 1. Study Findings

Discussion

Digital transformation drives SME performance by improving efficiency, customer engagement, and agility. In Jakarta's food sector, technologies like online platforms and mobile payments are leveraged not just for automation but to gain competitive advantage (Nugroho et al, 2023) (Supramono et al, 2024). More than a technical upgrade, digital transformation also facilitates business model innovation, enabling SMEs to rethink value delivery and revenue structures amid shifting consumer expectations (Anatan & Nur, 2023) (Varona et al, 2024).

Business model innovation contributes significantly to performance by helping SMEs adapt offerings, delivery methods, and pricing to digital market demands. However, digital adoption alone is insufficient—its impact depends on how well it is integrated into innovative business models. Technology must be aligned with organizational transformation to yield sustained benefits (Supramono et al, 2024).

For practitioners, these findings suggest that digital tools should be deployed alongside strategic BMI efforts. Managers should prioritize new revenue models and flexible service designs, while enhancing internal capabilities in digital leadership and experimentation. Policymakers and ecosystem enablers should go beyond infrastructure and actively support SME capacity-building for innovation-driven transformation.

Conclusion

Digital transformation directly enhances SME performance and indirectly does so through business model innovation. This dual pathway underscores BMI's strategic importance in converting digital investments into competitive advantage. The statistically significant mediation effect reveals that digital tools are most valuable when coupled with agile, innovative business configurations—offering theoretical depth and actionable insight for research and practice alike. Future studies should explore sectoral and regional variations in how digital transformation shapes business model

innovation. Longitudinal approaches could uncover how these relationships evolve over time, while comparative cross-country analyses would enrich understanding of contextual dynamics and policy effectiveness in digital SME ecosystems.

The practical recommendation for SME managers is to align digital investments with coherent business model reconfigurations that foster both value creation and value capture. Specifically, rather than adopting digital technologies in isolation, firms should strategically integrate them into their operations and offerings to ensure organizational coherence and performance sustainability. Additionally, the government and development stakeholders are encouraged to design support mechanisms that not only promote digital adoption but also build SME capabilities in business model innovation. This includes targeted training, knowledge-sharing platforms, and incentive structures that reduce experimentation costs. By emphasizing the interplay between digitalization and business model innovation, these recommendations aim to position SMEs for long-term competitive advantage in increasingly digitalized markets.

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