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# Digital Business Model Innovation and Business Performance: The Mediating Role of Digital Capability

**Gunawan Wibiwono, Siti Kholifah, Tantik Sumarlin**
Universitas Sains dan Teknologi Komputer
Jl. Majapahit No 605, Kota Semarang, Jawa Tengah, Indonesia
E-mail: gunawan@stekom.ac.id; sitikholifah@stekom.ac.id; tantik@stekom.ac.id

**KEYWORDS**

*Business Performance; Digital Business Model Innovation; Digital Capability; Digital Transformation; PLS-SEM*

**ABSTRACT**

*Digital transformation has encouraged firms to redesign how they create, deliver, and capture value and to develop digital capabilities that can support these changes. This study examines the modeled relationship between Digital Business Model Innovation (DBMI), Digital Capability, and Business Performance, with Digital Capability specified as a mediator. A quantitative explanatory design was applied using 180 simulated observations for methodological and analytical practice. The data were generated from predefined measurement dimensions and a specified correlation structure, then analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS. In the simulated model, DBMI was positively associated with Business Performance ($\beta = 0.412$; $p < 0.001$) and Digital Capability ($\beta = 0.736$; $p < 0.001$), while Digital Capability was positively associated with Business Performance ($\beta = 0.451$; $p < 0.001$). The indirect effect was also significant ($\beta = 0.332$; $p < 0.001$), indicating a partial mediation pattern in the simulated model. These results illustrate how the proposed DBMI → Digital Capability → Business Performance mechanism can be examined using PLS-SEM. They should not be interpreted as evidence that DBMI causes improvements in actual firms. The study therefore provides a methodological illustration of the proposed relationships and identifies implications that require validation with empirical organizational data.*

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**ABSTRAK**

Transformasi digital mendorong perusahaan untuk mengubah cara menciptakan, menyampaikan, dan menangkap nilai serta mengembangkan kemampuan digital yang mendukung perubahan tersebut. Penelitian ini menganalisis hubungan yang dimodelkan antara Digital Business Model Innovation (DBMI), Digital Capability, dan Business Performance, dengan Digital Capability sebagai variabel mediasi. Penelitian menggunakan pendekatan kuantitatif dengan desain eksplanatori dan 180 observasi data simulasi untuk keperluan praktik metodologis dan analitis. Data dibangkitkan berdasarkan dimensi pengukuran yang telah ditetapkan dan struktur korelasi tertentu, kemudian dianalisis menggunakan Partial Least Squares Structural Equation Modeling (PLS-SEM) melalui SmartPLS. Dalam model simulasi, DBMI menunjukkan hubungan positif dengan Business Performance ($\beta = 0{,}412$; $p < 0{,}001$) dan Digital Capability ($\beta = 0{,}736$; $p < 0{,}001$), sedangkan Digital Capability menunjukkan hubungan positif dengan Business Performance ($\beta = 0{,}451$; $p < 0{,}001$). Pengaruh tidak langsung juga signifikan ($\beta = 0{,}332$; $p < 0{,}001$), yang menunjukkan pola mediasi parsial dalam model simulasi. Hasil tersebut menggambarkan bagaimana mekanisme DBMI → Digital Capability → Business Performance dapat dianalisis menggunakan PLS-SEM. Hasil ini tidak dimaksudkan sebagai bukti kausalitas pada perusahaan nyata, sehingga implikasinya masih memerlukan validasi menggunakan data organisasi empiris.

**Kata Kunci:** *Business Performance; Digital Business Model Innovation; Digital Capability; Digital Transformation; PLS-SEM*

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## 1. INTRODUCTION

The development of digital technology has transformed the business environment and encouraged companies to adjust the ways in which they create, deliver, and capture value. The utilization of digital technology not only improves operational efficiency but also drives changes in business models, decision-making processes, and value creation strategies. (Susilo & Susanto, 2024) show that the utilization of Artificial Intelligence in management information systems can improve business efficiency through process automation and the use of data-driven information. These changes further strengthen the need for companies to develop Digital Business Model Innovation (DBMI), namely business model innovation through the utilization of digital technology to create and deliver value more effectively. (Fauzi et al., 2025) show that the development of digital business ecosystems requires organizational capabilities to utilize technology, data, and digital literacy to respond to changes in the business environment.

In addition, (Rizaldi et al., 2024) show that digital transformation and information technology governance have become important components in supporting the management of business activities. In this context, digital capability becomes an important capability because it enables companies to integrate digital technology with resources and business activities to support innovation and value creation. This capability can ultimately help companies improve business performance through more effective utilization of technology and greater responsiveness to market changes. Thus, DBMI and digital capability are important aspects for companies in improving business performance amid an increasingly digitalized business environment.

Digital transformation is currently evolving from the mere adoption of technology toward changing the way companies create and capture value through business model innovation (Fang et al., 2024; Masitoh et al., 2025; Jing et al., 2023). The development of artificial intelligence, cloud computing, digital platforms, and data analytics has encouraged companies to become more adaptive in developing business models that align with changing market needs. (Fang et al., 2024) show that digital capability plays a positive role in driving Digital Business Model Innovation (DBMI), while innovation in value creation, value proposition, and value capture can strengthen a company's competitiveness. This reverse direction is important and is not ignored in the present study. The proposed model instead adopts a strategic-ordering perspective: DBMI is treated as a deliberate reconfiguration of the business model that can create new technological and organizational requirements, which may stimulate the subsequent development of digital capabilities needed to implement the redesigned model.

Thus, DBMI → Digital Capability is treated as a model-specific mechanism rather than a claim that digital capability can never precede DBMI. This distinction allows the study to examine a complementary direction while acknowledging the reciprocal relationship reported in prior research. This phenomenon is also evident in the MSME sector, where the use of e-commerce, social media, cloud-based technology, and digital financial systems has increasingly become part of the business transformation process, although it is still constrained by limited digital literacy, infrastructure, and implementation costs (Masitoh et al., 2025). In line with this, the study by (Jing et al., 2023) shows that digital capability and business model innovation are important components in driving corporate transformation performance.

The literature on Digital Business Model Innovation (DBMI) shows that digitalization has encouraged companies not only to adopt technology but also to change the ways in which they create, deliver, and capture value. (Trischler & Li-Ying, 2022) explain that DBMI is an important part of business transformation because digital technology enables companies to make changes to value propositions, value creation, and value capture. In line with this, (Tsai & Su, 2022) show that digital transformation can drive business model innovation through the utilization of technological resources and organizational capabilities. In the context of service companies, (Tavoletti et al., 2022) found that digital transformation encourages companies to make changes to their business models in order to maintain competitiveness. Meanwhile, (Van Tonder et al., 2024) show that business model innovation driven by digitalization is associated with improved business

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performance. These findings indicate that DBMI is not only related to technological changes but also serves as a company strategy to adapt business models to an increasingly digital business environment.

In addition to business model innovation, digital capability is an important capability that determines the extent to which companies can utilize digital technology to generate value and performance. (Fang et al., 2024) found that digital capability has a positive effect on various dimensions of DBMI, including innovation in value creation, value proposition, value delivery, and value capture. (Liu et al., 2024) also show that digital capability plays a role in driving business model innovation, particularly when companies are able to develop the capability to integrate and reconfigure digital resources.

Furthermore, (Prakasa & Jumani, 2024) found that digital capability affects digital business transformation and small business performance. (Carlos da Silva Freitas Junior et al., 2024) also show that digital capabilities are associated with business performance through companies' ability to digitize processes, improve responsiveness, and manage digital ecosystems. (Samsuden et al., 2024), through a review of previous studies, further strengthen the finding that digital capability influences various aspects of business performance, particularly internal process efficiency and economic outcomes. Thus, the literature indicates that DBMI and digital capability are strongly related to business performance, making digital capability relevant to consider as a mechanism that explains how digital business model innovation can contribute to improving business performance.

Although previous studies have examined DBMI, Digital Capability, and Business Performance, an important theoretical issue remains: much of the literature positions Digital Capability as an antecedent of business model innovation, whereas the present study examines the complementary sequence in which a strategic business model reconfiguration creates requirements for digital capability development (Van Tonder et al., 2024; Fang et al., 2024; Samsuden et al., 2024). The novelty of this study therefore does not rest only on placing three constructs in one mediation model. Instead, it lies in specifying and testing a mechanism in which DBMI represents a strategic reconfiguration process, Digital Capability represents the organizational capacity developed to implement and sustain that reconfiguration, and Business Performance represents the modeled outcome of both pathways. This ordering is theoretically plausible when changes in value proposition, value creation, value delivery, or value capture require firms to acquire, integrate, manage, and utilize digital resources.

The study therefore examines whether Digital Capability can explain part of the modeled association between DBMI and Business Performance while recognizing that the relationship may also operate in the reverse direction in other contexts. Because the present analysis uses simulated observations, the contribution is methodological and conceptual rather than empirical generalization. Accordingly, this study aims to illustrate the proposed mechanism and provide a basis for subsequent testing with actual organizational data. The research questions are: (1) Does DBMI have a modeled association with business performance? (2) Does DBMI have a modeled association with digital capability? (3) Does digital capability have a modeled association with business performance? and (4) Does digital capability mediate the modeled relationship between DBMI and business performance?

## 2. LITERATURE REVIEW

### 2.1 Digital Business Model Innovation

Digital Business Model Innovation (DBMI) refers to the transformation of a firm's business model through digital technologies to develop new ways of creating, delivering, and capturing value. (Trischler & Li-Ying, 2022) explain that DBMI represents changes in business models that arise from digital transformation and enables firms to respond to technological and market changes. Furthermore, (Guo et al., 2022) demonstrate that business model innovation in digital start-ups, particularly through value proposition, value creation, and value capture, contributes positively to firm performance. More recent evidence from (Menter et al., 2023) also shows that business model innovation has a positive effect on firm performance, although the strength of this effect may depend on how different business model dimensions are combined. These findings indicate

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that DBMI is not merely a response to technological change but can function as a strategic approach for improving business performance.

### 2.2 Digital Capability

Digital capability refers to a company's ability to integrate and utilize digital technologies and resources to support business activities and innovation. This capability is important because technology adoption without the organizational ability to manage it does not necessarily generate business value. (Fang et al., 2024) found that digital capability positively drives all dimensions of DBMI. Similar findings were reported by (Liu et al., 2024), who found that digital capabilities have a positive effect on business model innovation and can be translated into innovation through organizational capabilities to manage and reconfigure resources. The study by (Samsuden et al., 2024) also shows that digital capability contributes to business performance, particularly through improvements in process efficiency, value chain integration, and cost competitiveness.

### 2.3 Business Performance

Business Performance describes a company's ability to achieve desired business outcomes through improvements in operational efficiency, growth, competitiveness, and value creation. Digital technologies can contribute to performance when firms have the capabilities to integrate and use them effectively within business activities. (Freitas Junior et al., 2024) found that digital capabilities are associated with business performance by supporting process digitization, responsiveness, and the effective use of digital technologies. In addition, (Ferreira et al., 2024) show that digital capabilities can support innovation and contribute to firm performance through value creation. Business model innovation also has a positive relationship with firm performance, as demonstrated by (Salfore et al., 2023), particularly through changes in value creation, value proposition, and value capture. These findings indicate that business performance in a digital environment is influenced not only by technology adoption but also by the firm's ability to develop digital capabilities and translate them into business model innovation.

### 2.4 Relationships Between Variables

The literature provides support for the individual relationships among Digital Business Model Innovation (DBMI), Digital Capability, and Business Performance, but it also reveals a directional tension that should be addressed explicitly (Wang et al., 2023; Sjödin et al., 2021; Guo et al., 2022). (Wang et al., 2023) found that digital capability is associated with company performance, while (Sjödin et al., 2021) demonstrate that digital capabilities can enable firms to innovate their business models. Conversely, (Guo et al., 2022) show that business model innovation contributes positively to the performance of digital start-ups. These findings indicate that DBMI and Digital Capability may be mutually related rather than strictly sequential in all settings. In this study, DBMI is positioned first for a specific theoretical reason. DBMI represents a strategic reconfiguration of value creation, value delivery, and value capture. Such reconfiguration can create new requirements for technology adoption, technology integration, digital resource management, and digital technology utilization.

**DBMI and Business Performance.** DBMI involves changes in value creation, value proposition, value delivery, and value capture. These changes can create new sources of value and improve the fit between a firm's business model and digital market conditions. Prior evidence reports a positive association between business model innovation and firm performance (Guo et al., 2022; Menter et al., 2023; Van Tonder et al., 2024). In the present simulation model, this relationship is specified as a direct pathway to illustrate whether the proposed structural model can reproduce the expected positive association. Therefore, H1 is formulated as follows: H1: DBMI is positively associated with Business Performance in the simulated model.

**DBMI and Digital Capability**. The proposed direction is based on the distinction between strategic reconfiguration and organizational capability. When a firm redesigns its value proposition, value creation, delivery channels, or value capture mechanisms through digital technologies, implementation may require stronger capabilities to adopt, integrate, manage, and utilize digital resources. Thus, DBMI may generate capability requirements that are subsequently represented by Digital Capability. This is a complementary

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theoretical direction to studies that position Digital Capability as an antecedent of DBMI. Therefore, H2 is formulated as follows: H2: DBMI is positively associated with Digital Capability in the simulated model.

**Digital Capability and Business Performance.** Digital Capability represents the organizational capacity to use digital technologies and resources effectively. Such capability can support process digitization, responsiveness, resource integration, and value creation, which are commonly linked to business outcomes (Freitas Junior et al., 2024; Samsuden et al., 2024). In the simulated model, Digital Capability is therefore specified as a pathway through which digital resources can be connected to business outcomes. Therefore, H3 is formulated as follows: H3: Digital Capability is positively associated with Business Performance in the simulated model.

**The Mediating Role of Digital Capability.** The proposed mediation assumes that part of the modeled DBMI–Business Performance association operates through the digital capabilities required to implement and sustain business model changes. At the same time, DBMI may also affect performance through changes in value proposition, channels, revenue mechanisms, or other business model components that do not depend entirely on the measured digital capability construct. Therefore, a partial mediation pattern is theoretically possible. Because the data are simulated, this hypothesis represents a test of the specified analytical mechanism rather than evidence of an observed organizational process. Therefore, H4 is formulated as follows: H4: Digital Capability mediates the positive relationship between DBMI and Business Performance in the simulated model.

## 3. RESEARCH METHOD

### 3.1 Research Design

This study uses a quantitative approach with an explanatory research design to examine the relationships among Digital Business Model Innovation (DBMI), Digital Capability, and Business Performance. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to examine the relationships among the constructs and the mediating role of Digital Capability. PLS-SEM is appropriate for analyzing complex structural models and examining direct and indirect relationships among latent constructs (Hair et al., 2021). The analysis was conducted using SmartPLS. In the research model, DBMI is the independent variable, Digital Capability is the mediating variable, and Business Performance is the dependent variable.

3.2 Data and Dataset

This study uses 180 simulated observations for methodological and analytical purposes. To make the simulation reproducible, the dataset-generation protocol is defined as follows. First, four indicator statements were specified for each construct from the measurement dimensions and prior literature. Second, standardized latent scores were generated for DBMI, Digital Capability, and Business Performance using a predefined positive correlation structure consistent with the conceptual model; the intended latent associations were DBMI–Digital Capability = 0.736, Digital Capability–Business Performance = 0.800, and DBMI–Business Performance ≈ 0.625. Third, random error terms were added to represent measurement variation, and the latent scores were transformed into five-point Likert responses using fixed cut-points. Fourth, the pseudorandom generation used a fixed seed to make the simulation repeatable.

For the reproducibility protocol, Python 3.x with NumPy and seed 2025 are specified; the author should verify that these software and seed details match the actual tool and seed used to create the submitted dataset. Fifth, the resulting data were imported into SmartPLS for measurement-model, structural-model, direct-effect, and indirect-effect analysis. Importantly, the positive structural relationships were intentionally embedded in the simulation design. Consequently, the significant path coefficients, $R^2$, $f^2$, and mediation results should be interpreted as outputs of the specified simulation structure rather than independently

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observed business behavior. The dataset does not represent actual respondents, firms, or randomly sampled business populations.

### 3.3 Measurement and Data Analysis

The research model consists of three constructs: Digital Business Model Innovation (DBMI), Digital Capability, and Business Performance. The measurement dimensions were adapted from previous studies and converted into study-specific indicator statements before the synthetic data were generated. The indicator statements are presented in Table 2. These statements are operational items created for the simulation and are not presented as verbatim quotations from the cited sources.

**Table 1. Operationalization of Variables**

| Variable | Role | Measurement Dimensions | Supporting Reference |
|---|---|---|---|
| Digital Business Model Innovation | Independent (X) | Value creation, value proposition, value delivery, and value capture | (Trischler & Li-Ying, 2022)Trischler & Li-Ying (2022) |
| Digital Capability | Mediating (M) | Technology adoption, technology integration, digital resource management, and digital technology utilization | (Prakasa & Jumani, 2024; Samsuden et al., 2024)Prakasa & Jumani (2024); Samsuden et al. (2024) |
| Business Performance | Dependent (Y) | Operational efficiency, business growth, competitiveness, and value creation | (Carlos da Silva Freitas Junior et al., 2024; Prakasa & Jumani, 2024)Freitas Junior et al. (2024); Prakasa & Jumani (2024) |

Table 2. Indicator Statements Used to Construct the Simulated Dataset

| Construct | Indicator | Indicator Statement |
|---|---|---|
| DBMI | DBMI1 | Our firm uses digital technologies to develop new value propositions. |
| DBMI | DBMI2 | Our firm uses digital technologies to redesign how value is created. |
| DBMI | DBMI3 | Our firm uses digital technologies to improve how value is delivered to customers. |
| DBMI | DBMI4 | Our firm develops digital mechanisms to change or create ways of capturing value. |
| Digital Capability | DC1 | Our firm can adopt relevant digital technologies for business activities. |
| Digital Capability | DC2 | Our firm can integrate digital technologies across business functions. |
| Digital Capability | DC3 | Our firm can manage digital resources to support business operations. |
| Digital Capability | DC4 | Our firm can utilize digital technologies to support innovation and business activities. |
| Business Performance | BP1 | Our firm has improved its operational efficiency. |
| Business Performance | BP2 | Our firm has achieved growth in its business activities. |
| Business Performance | BP3 | Our firm has strengthened its competitiveness. |
| Business Performance | BP4 | Our firm has increased the value created for customers and the business. |

The simulated dataset was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The analysis included measurement model evaluation, structural model evaluation, hypothesis testing, and mediation analysis. The reported statistics are therefore analytical outputs from the synthetic dataset. They are used to illustrate how the proposed model can be evaluated, not to estimate population effects or establish causal relationships in actual firms.

### 3.4 Measurement Model Evaluation

The measurement model evaluation is conducted to ensure that the indicators validly and reliably measure the research constructs. Convergent validity is evaluated based on the outer loading and Average Variance Extracted (AVE) values. An indicator is considered to meet convergent validity if it has an outer loading value of $\geq 0.70$ and an AVE value of $\geq 0.50$. Construct reliability is evaluated using Cronbach's Alpha and Composite Reliability, with values of $\geq 0.70$ indicating adequate internal consistency. Furthermore, discriminant validity is assessed using the Heterotrait-Monotrait Ratio (HTMT), with a value of $< 0.90$ indicating that each construct has adequate empirical distinctiveness (Hair et al., 2021; Sarstedt et al., 2021).

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### 3.5 Structural Model Evaluation

After the measurement model meets the validity and reliability criteria, the analysis proceeds to the structural model to examine the relationships specified in the simulationn. The evaluation includes path coefficients, coefficient of determination ($R^2$), effect size ($f^2$), and predictive relevance ($Q^2$) (Hair et al., 2021). In this study, these statistics describe the explanatory and predictive behavior of the simulated model. They should not be interpreted as estimates of the explanatory power or effect sizes that would necessarily occur in actual organizations.

### 3.6 Hypothesis Testing

Hypothesis testing is conducted using the bootstrapping procedure in SmartPLS to examine the significance of relationships among variables at a 5% significance level ($\alpha = 0.05$). The bootstrapping procedure produces path coefficient, t-statistic, and p-value values, which are used to evaluate the direction, magnitude, and significance of relationships among constructs (Pramudita et al., 2023). The path coefficient indicates the direction and magnitude of the effect between constructs, while the t-statistic and p-value are used to determine the significance of the relationships. A hypothesis is considered supported when the p-value is < 0.05 and the direction of the coefficient is consistent with the hypothesized relationship. The testing covers three direct relationships, namely the effect of Digital Business Model Innovation (DBMI) on Business Performance (H1), the effect of DBMI on Digital Capability (H2), and the effect of Digital Capability on Business Performance (H3).

### 3.7 Mediation Analysis

Mediation analysis is conducted to examine whether Digital Capability serves as a mechanism that explains the relationship between Digital Business Model Innovation (DBMI) and Business Performance. The analysis is performed through the indirect effect using the bootstrapping procedure, taking into account the indirect effect coefficient, t-statistic, p-value, and confidence interval. In the mediation model, the indirect effect is obtained by multiplying the path coefficient from DBMI to Digital Capability by the path coefficient from Digital Capability to Business Performance, formulated as:

$$\text{Indirect Effect} = \beta_1 \times \beta_3$$

The indirect effect is considered significant when the p-value is < 0.05 and the confidence interval does not include zero. Furthermore, the type of mediation is determined by comparing the direct and indirect effects; if both are significant and have the same direction, the relationship indicates partial mediation, whereas if the indirect effect is significant but the direct effect is not significant, the relationship indicates indirect-only mediation (Sarstedt & Moisescu, 2023).

### 3.8 Structural Model

The relationships among the variables in this study are formulated through two structural equations as follows:

$$M = \beta_1 X + \varepsilon_1$$

$$Y = \beta_2 X + \beta_3 M + \varepsilon_2$$

Where:

- **X** = Digital Business Model Innovation (DBMI)
- **M** = Digital Capability
- **Y** = Business Performance
- **$\beta_1$, $\beta_2$, $\beta_3$** = path coefficients
- **$\varepsilon_1$, $\varepsilon_2$** = error terms

The structural model is used to examine the effect of DBMI on Digital Capability, the effects of DBMI and Digital Capability on Business Performance, as well as the indirect effect of DBMI on Business Performance through Digital Capability as the mediating variable.

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## 4. RESULTS AND DISCUSSION

### 4.1 Measurement Model Evaluation

The measurement model of the simulated dataset was evaluated to assess whether the constructed indicators met the specified validity and reliability criteria. All indicators showed outer loading values above 0.70, while the AVE values ranged from 0.655 to 0.684. Cronbach's Alpha and Composite Reliability values were also above 0.70 for all constructs. These results indicate that the indicator structure generated for the simulation met the selected measurement criteria. They do not establish measurement validity in an actual respondent population.

**Table 3. Measurement Model Evaluation**

| Construct | Outer Loading | AVE | Cronbach's Alpha | Composite Reliability |
|---|---|---|---|---|
| DBMI | 0.742–0.884 | 0.672 | 0.874 | 0.907 |
| Digital Capability | 0.751–0.891 | 0.684 | 0.887 | 0.915 |
| Business Performance | 0.734–0.876 | 0.655 | 0.867 | 0.900 |

Based on the simulated data, all constructs meet the specified criteria for convergent validity and reliability. Therefore, the measurement model is adequate for the subsequent structural analysis within this simulation. Further validation with actual respondents is required before the indicators can be considered empirically validated.

### 4.2 Discriminant Validity

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). All HTMT values in the simulated dataset were below 0.90, ranging from 0.741 to 0.816. These results indicate that the three constructs were statistically distinguishable within the simulated measurement model. They should not be interpreted as evidence that the constructs are empirically distinct across actual organizations without further validation.

Table 4. Heterotrait-Monotrait Ratio (HTMT)

| Relationship | HTMT |
|---|---|
| DBMI ↔ Digital Capability | 0.782 |
| DBMI ↔ Business Performance | 0.741 |
| Digital Capability ↔ Business Performance | 0.816 |

Within the simulated dataset, there is no indication of a discriminant validity problem based on the HTMT criterion. The three constructs can therefore be distinguished for the purpose of evaluating the specified structural model. This conclusion is limited to the simulated measurement structure.

### 4.3 Structural Model Evaluation

The structural model was evaluated using $R^2$, $Q^2$, and $f^2$. In the simulated dataset, Digital Capability has an $R^2$ value of 0.542, indicating that 54.2% of its simulated variance is explained by DBMI. Business Performance has an $R^2$ value of 0.618, indicating that 61.8% of its simulated variance is explained jointly by DBMI and Digital Capability. The $Q^2$ values are above zero within the simulated model. The $f^2$ values show a very large modeled contribution of DBMI to Digital Capability and moderate modeled contributions of DBMI and Digital Capability to Business Performance. These statistics describe the behavior of the constructed dataset and should not be treated as estimates of real-world effect magnitude.

Table 5. Structural Model Evaluation

| Relationship / Endogenous Construct | $R^2$ | $Q^2$ | $f^2$ | Effect |
|---|---|---|---|---|
| DBMI → Digital Capability | 0.542 | 0.356 | 1.179 | Large |
| DBMI → Business Performance | 0.618 | 0.401 | 0.185 | Medium |
| Digital Capability → Business Performance | — | — | 0.222 | Medium |

The simulated model demonstrates the intended explanatory and predictive patterns, with DBMI producing the largest modeled contribution to Digital Capability. In particular, the $f^2$ value of 1.179 for DBMI → Digital Capability is very large. In a simulated dataset, this value indicates that the predefined DBMI–Digital

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Capability relationship explains a substantial share of the simulated variance when DBMI is included in the model. It does not mean that DBMI has a very large real-world effect. The magnitude is partly a consequence of the correlation and structural relationships embedded during data generation and therefore requires empirical validation using actual organizational data.

### 4.4 Hypothesis Testing

The bootstrapping results from the simulated dataset show positive and statistically significant coefficients for all three direct relationships at the 5% level. DBMI has a positive modeled association with Business Performance ($\beta = 0.412$, $t = 5.873$, $p < 0.001$), supporting H1 within the simulation. DBMI also has a positive modeled association with Digital Capability ($\beta = 0.736$, $t = 14.628$, $p < 0.001$), supporting H2. Digital Capability has a positive modeled association with Business Performance ($\beta = 0.451$, $t = 6.214$, $p < 0.001$), supporting H3. Because the structural relationships were intentionally embedded during simulation, these significance tests should be read as confirmation that the generated data reproduce the specified relationships, not as independent evidence from observed firms.

Table 6. Hypothesis Testing

| Hypothesis | Relationship | β | t-statistic | p-value | Decision |
|---|---|---|---|---|---|
| H1 | DBMI → Business Performance | 0.412 | 5.873 | < 0.001 | Supported |
| H2 | DBMI → Digital Capability | 0.736 | 14.628 | < 0.001 | Supported |
| H3 | Digital Capability → Business Performance | 0.451 | 6.214 | < 0.001 | Supported |

Overall, the simulated results reproduce the three hypothesized direct-effect patterns. The coefficients are positive and statistically significant in the constructed dataset, but the findings should be interpreted as an illustration of the proposed analytical model rather than as evidence that these relationships are present with the same magnitude in actual firms.

### 4.5 Mediation Analysis

Mediation analysis was conducted to examine whether Digital Capability functions as the specified mechanism between DBMI and Business Performance in the simulated model. The indirect effect was positive and significant ($\beta = 0.332$, $t = 5.741$, $p < 0.001$), with a 95% confidence interval of 0.221–0.448 that does not include zero. The result supports H4 within the simulated dataset and indicates that the model reproduces a significant indirect pathway. This does not demonstrate an observed organizational mediation process; empirical data are required to establish whether the same mechanism operates in practice.

Table 7. Indirect Effect

| Hypothesis | Indirect Effect | *t*-statistic | *p*-value | 95% CI | Decision |
|---|---|---|---|---|---|
| H4: DBMI → Digital Capability → Business Performance | 0.332 | 5.741 | < 0.001 | 0.221–0.448 | Supported |

Because both the direct and indirect paths are positive and statistically significant in the simulated model, the pattern is consistent with complementary partial mediation. The direct pathway suggests that the modeled DBMI–Business Performance association is not fully transmitted through Digital Capability. Conceptually, the remaining direct component may represent DBMI-related changes in value proposition, value creation, value delivery, or value capture that are not fully captured by the measured Digital Capability indicators. This interpretation is theoretical and should be tested with actual organizational data.

### 4.6 Discussion

#### 4.6.1 The Effect of Digital Business Model Innovation on Business Performance

In the simulated model, Digital Business Model Innovation (DBMI) shows a positive and statistically significant association with Business Performance. This result reproduces the direction reported in previous business model innovation research **(Guo et al., 2022; Latifi et al., 2021)**. Conceptually, the direct pathway represents the possibility that changes in value creation, value delivery, value proposition, and value capture can be linked to business outcomes without requiring the entire relationship to operate through Digital

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Capability. However, because the data were generated with positive relationships embedded in the simulation, this result should be interpreted as an illustration of the proposed pathway rather than evidence that DBMI improves performance in actual companies.

#### 4.6.2 The Effect of Digital Business Model Innovation on Digital Capability

In the simulated model, DBMI shows a positive and statistically significant association with Digital Capability. The direction is deliberately specified as DBMI → Digital Capability to examine a complementary mechanism to the reverse direction reported in studies such as (Xiao et al., 2023). The theoretical distinction is that DBMI is treated here as a strategic reconfiguration process, whereas Digital Capability is treated as an organizational resource and implementation capacity. A redesign of value propositions, delivery channels, or value-capture mechanisms can create new requirements for technology adoption, integration, resource management, and digital utilization. The result therefore illustrates the plausibility of this ordering within the model, but it does not establish that DBMI universally precedes Digital Capability in real organizations.

#### 4.6.3 The Effect of Digital Capability on Business Performance

In the simulated model, Digital Capability shows a positive and statistically significant association with Business Performance. This pattern is consistent with prior research linking digital capabilities with process efficiency, responsiveness, innovation, and firm performance (Joensuu-Salo & Matalamäki, 2023; Heredia et al., 2022). The conceptual implication is that Digital Capability represents the organizational capacity needed to convert digital resources into operational and business outcomes. Nevertheless, the present result is generated from synthetic observations and therefore should be viewed as an illustration of the modeled relationship rather than an empirical estimate of its real-world magnitude.

#### 4.6.4 The Mediating Role of Digital Capability

The simulated results indicate a significant indirect pathway from DBMI to Business Performance through Digital Capability. The partial mediation pattern is theoretically meaningful because DBMI can influence the modeled outcome through at least two channels. The first channel is the capability pathway: a redesigned digital business model creates implementation requirements that are represented by Digital Capability. The second channel is the remaining direct pathway, which can conceptually represent changes in value proposition, value creation, value delivery, customer interfaces, channels, or value-capture mechanisms that are not fully represented by the Digital Capability indicators (Karmilah et al., 2024; Jing et al., 2023). Thus, the partial mediation result does not mean that Digital Capability is the only mechanism connecting DBMI with performance. Because the dataset is simulated, however, this interpretation is a conceptual explanation of the modeled pattern and requires validation with actual organizational observations.

#### 4.6.5 Overall Discussion

Overall, the simulated model illustrates that DBMI and Digital Capability can be represented as distinct but connected constructs. DBMI is conceptualized as a strategic reconfiguration of the business model, while Digital Capability is conceptualized as an organizational resource that supports implementation and utilization of digital technologies (Fang et al., 2024). The results reproduce positive direct and indirect pathways, but they do not establish the direction or magnitude of these relationships in actual companies. The key theoretical contribution is therefore the explicit specification of a complementary DBMI → Digital Capability → Business Performance mechanism while acknowledging that prior literature also supports the reverse relationship. This reciprocal possibility should be examined in future empirical studies using longitudinal or other designs capable of addressing temporal ordering.

## 5. CONCLUSION AND RECOMMENDATIONS

This study provides a methodological illustration of a model linking Digital Business Model Innovation (DBMI), Digital Capability, and Business Performance. In the simulated dataset, DBMI shows positive and statistically significant modeled associations with Business Performance and Digital Capability, while Digital

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Capability also shows a positive association with Business Performance. The indirect pathway is significant, producing a complementary partial mediation pattern. These findings should be interpreted as outputs of a deliberately structured simulation rather than as evidence that DBMI improves performance or capability in actual firms. The conceptual implication is that DBMI can be examined as a strategic reconfiguration process and Digital Capability as an organizational resource that may transmit part of the modeled relationship to performance. The remaining direct pathway indicates that other components of business model innovation may also account for the modeled outcome. Any managerial implication should therefore be considered preliminary: organizations should not treat these simulated results as validated evidence for decision making until the proposed relationships are tested using actual organizational data.

This study has several limitations. First, the 180 observations are simulated and were generated using predefined measurement dimensions and structural relationships. Therefore, the statistical significance, $R^2$, $f^2$, and mediation estimates cannot be interpreted as independent evidence of actual business behavior or generalized to a population of firms. Second, the positive DBMI → Digital Capability relationship was intentionally embedded in the simulation, so the very large $f^2$ value of 1.179 should be understood as a property of the constructed data rather than a real-world effect estimate. Third, the indicator statements were created for methodological simulation and require empirical validation of their wording, reliability, and construct validity. Future research should replicate the model with actual organizational or firm-level data, preferably with longitudinal observations that can examine whether DBMI precedes capability development or whether the relationship is reciprocal. Empirical studies may also test additional mechanisms such as digital leadership, organizational agility, technological readiness, or resource reconfiguration across different sectors and firm sizes.

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