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HOW ABSORPTIVE CAPACITY DRIVES BUSINESS MODEL INNOVATION THROUGH STRATEGIC AGILITY: AN EMPIRICAL STUDY OF AN INDONESIAN STATE-OWNED LOGISTICS ENTERPRISE

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Abstract. This study examines the impact of absorptive capacity and strategic agility on Business Model Innovation (BMI) in Indonesia's logistics sector, emphasizing the mediating role of strategic agility. A quantitative survey was conducted among 434 managerial employees of a state-owned logistics enterprise in Indonesia, with data analyzed using Structural Equation Modelling – Partial Least Squares (SEM-PLS). The findings reveal that absorptive capacity significantly enhances both strategic agility and BMI, while strategic agility not only directly influences BMI but also partially mediates the relationship between absorptive capacity and BMI. These results highlight the importance of dynamic capabilities in sustaining a competitive advantage through business model innovation. This study contributes to Dynamic Capability Theory (DCT) by empirically demonstrating the mediating role of strategic agility in the absorptive capacity–BMI relationship, addressing a gap in the literature by exploring how logistics firms leverage internal capabilities for continuous innovation. From a practical perspective, logistics firms should invest in digital technologies, enhance knowledge management, and foster strategic agility to remain adaptable in an evolving market. However, as this study focuses on an Indonesian state-owned logistics enterprise, its generalizability is limited, and future research should examine multiple firms across different industries to strengthen external validity.

Keywords: absorptive capacity, strategic agility, business model innovation, dynamic capability theory, logistics industry.

JEL Classification: L25, M10, O31.

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1. Introduction

The rapid expansion of Indonesia's digital economy has significantly transformed its e-commerce industry, positioning it as a critical driver of economic growth. The value of Indonesia's digital economy increased from US$41 billion in 2019 to US$77 billion in 2022, with projections indicating further growth to US$130 billion by 2025 and a potential surge to US$360 billion by 2030 (Katadata Insight Center, 2023). As the largest e-commerce market in Southeast Asia, contributing 52% of the region's Gross Merchandise Value (GMV) (CNBC Indonesia, 2023), Indonesia holds immense economic potential. Despite increasing demand for efficient logistics services, Indonesia's logistics sector struggles to keep pace with the evolution of e-commerce. The industry faces gaps in digital infrastructure, limited integration of advanced technologies (e.g., AI, RFID, and blockchain) and suboptimal digital innovation integration (Tengara Strategics, 2024). These challenges lead to rising operational cost, supply chain inefficiencies, heightened business uncertainty, and declining customer satisfaction (Restuputri et al., 2021; Dağdeviren & Mirza, 2024). Without strategic interventions, the gap between e-commerce expansion and logistics readiness will continue to widen, potentially hindering Indonesia's digital economy growth. Constraints in logistics infrastructure may impede the expansion of e-commerce and, more broadly, Indonesia's digital economy (Lanteng, 2024).

Several logistics in Indonesia are experiencing these challenges firsthand. Despite having longer industry experience and greater resource access than competitors, some companies struggle to improve market performance. Market share data indicates that leading competitors dominate more than 30% of the market, while certain firms continue to lag behind (Purnama, 2022). This highlight the need for adaptive and innovative strategies to sustain competitiveness. To address these challenges, firms must develop a more strategic and flexible approach that allows them to adapt to industry changes while leveraging digital transformation effectively.

Dynamic Capability Theory (DCT) provides a relevant conceptual framework to understand how logistics firms can develop adaptive strategies in response to rapidly evolving business environment. Originating from Resource-Based Theory (RBT), DCT emphasizes the continuous development and refinement of a firm's core competencies to maintain competitiveness (Teece, 2018; Teece et al., 2016). Three key dynamic capabilities are particularly critical in this context: absorptive capacity, which refers to a firm's ability to acquire, assimilate, and apply external knowledge for technological adoption and strategic adjustments (Zahra & George, 2002); strategic agility, which enables firms to rapidly adapt to market changes through flexible decision-making and resource allocation (Doz, 2020); and Business model innovation (BMI), the process of reconfiguring or reinventing business model to enhance efficiency and competitiveness (Li, 2025).

While previous studies have examined the relationship between absorptive capacity, strategic agility, and BMI, existing literature lacks a comprehensive exploration of how these factors interact within Indonesia's logistics industry. Some studies confirm that absorptive capacity positively influences both strategic agility and BMI (Kale et al., 2019; Mata et al., 2023; Tufan & Mert, 2023). However, other findings suggest that that realized absorptive capacity does not always translate into BMI improvements (Miroshnychenko et al., 2021), raising questions about the mechanisms affecting this relationship. Additionally, the mediating role of strategic agility between absorptive capacity and BMI remains underexplored, particularly in Indonesia's logistics sector (Clauss et al., 2021; Doz, 2020). Given the importance of these factors in fostering competitiveness and innovation, an integrated approach that examines their interactions in a dynamic market environment is essential.

Moreover, the need to examine this relationship becomes particularly salient in the logistics industry, where business model innovation operates through mechanisms distinct from those observed in manufacturing or technology-driven sectors. Recent studies emphasize the centrality of network orchestration and digitally enabled coordination in logistics value creation (Cruz-Sánchez et al., 2026; Zhou & Kuang, 2025). In such coordination-intensive environments, firms rely on real-time information integration and the alignment of distributed physical and digital resources to enable adaptive service delivery and ecosystem collaboration (Maycotte et al., 2025). Consequently, BMI in logistics extends beyond internal strategic redesign and entails the reconfiguration of distribution networks, digital platforms, and collaborative service architectures (Oguntegbe et al., 2024). The network-embedded and operationally intensive nature of logistics activities implies that transforming absorbed knowledge into business model innovation requires not only knowledge assimilation but also the agile orchestration of tightly coupled supply chain structures (Zhou & Kuang, 2025). This industry-contingent mechanism suggests that the effectiveness of dynamic capabilities in logistics depends on their ability to support real-time network reconfiguration, thereby positioning absorptive capacity and strategic agility as jointly embedded coordination capabilities within digitally evolving supply ecosystems (Cruz-Sánchez et al., 2026; Maycotte et al., 2025).

The primary objective of this study is to examine whether strategic agility mediates the relationship between absorptive capacity and business model innovation in the Indonesian logistics industry. Grounded in Dynamic Capability Theory, this study seeks to clarify how knowledge absorption is translated into adaptive business model transformation through strategic agility. To achieve this objective, the following research questions are addressed: (1) How does absorptive capacity influence strategic agility? (2) How does absorptive capacity influence BMI? (3) How does strategic agility influence BMI? (4) Does strategic agility mediate the relationship between absorptive capacity and BMI? By empirically investigating these relationships through a survey-based quantitative approach targeting managerial-level employees in an Indonesian logistics firm, this research contributes to Dynamic Capability Theory (DCT) by providing industry-specific evidence of the mediating role of strategic agility in driving business model innovation.

Beyond its theoretical contribution, this study provides valuable insights for logistics companies in Indonesia, in addressing digital transformation challenges and supply chain complexity. Understanding the interaction between absorptive capacity, strategic agility and BMI will enable logistics firms to: (1) enhance digital adoption by leveraging external knowledge for faster technological integration, (2) develop strategic agility to improve responsiveness to market disruptions and evolving customer expectations, and (3) optimize business model innovation by reconfiguring value creation, value proposition, and value capture mechanisms. By offering actionable strategies, this research aims to support logistics companies in navigating digital disruptions, strengthening competitiveness, and achieving sustainable growth in Indonesia's rapidly evolving digital economy.

2. Literature review

The purpose of this section is to establish the theoretical foundation of the study by reviewing the key constructs underpinning the proposed research model. Drawing upon Dynamic Capability Theory, this section synthesizes prior literature on absorptive capacity, strategic agility, and business model innovation. It also develops the conceptual relationships among these constructs and formulates the research hypotheses guiding the empirical investigation.

2.1. Absorptive capacity

Absorptive capacity, is a firm's ability to acquire, assimilate, transform, and exploit external knowledge to enhance performance (Zahra & George, 2002), is a strategic asset for logistics companies in today's dynamic industry. This

intangible asset is influenced by both internal factors, such as employee expertise and cross-departmental learning (Leng et al., 2025), and external factors, including business partnerships and market information access. Absorptive capacity enables logistics firms to analyze market trends, adopt technological innovations, anticipate customer needs, improve operational efficiency, and adjust business models effectively (Bashir et al., 2024). More broadly, it facilitates the integration of external knowledge, thereby creating opportunities for innovation and enhancing organizational performance (Hermawan et al., 2025). It comprises two dimensions: potential absorptive capacity, which involves identifying and acquiring external knowledge, and realized absorptive capacity, which focuses on transforming and utilizing acquired knowledge to drive innovation and strategy (Zahra & George, 2002). By optimizing both dimensions, logistics companies can accelerate adaptation to market changes, create sustainable value, and maintain a competitive advantage (Abourokbah et al., 2023; Hussain et al., 2022).

2.2. Strategic agility

Strategic agility, an organization's ability to swiftly respond and adapt to changes in a dynamic an uncertain business environment (Doz, 2020), is crucial for logistics companies to address challenges such as supply chain disruptions, competitive pressures, and increasing customer expectations. This concept comprises three key components: resource flexibility, sensitivity to market opportunities, and strategic innovation. Resource flexibility enables logistics firms to reallocate fleets, labor, and technology to accommodate shifting market needs, while strategic sensitivity allows them to identify market demands, including the adoption of technology-driven solutions and eco-friendly practices (Albayraktaroglu, 2024; Alkandi & Helmi, 2024). By implementing strategic agility effectively, logistics companies can enhance responsiveness to market fluctuations, improve resource allocation, achieve greater operational efficiency, and foster a sustainable competitive advantage by enabling rapid adaptation to emerging opportunities (Doz, 2020). Moreover, this approach strengthening business resilience against disruptions, supporting environmental sustainability, and ensuring the continued viability of logistics companies in the long term (Doz, 2020). In conclusion, by embracing strategic agility, logistics firms can better navigate market changes, their competitiveness, and secure long-term business sustainability in an increasingly dynamic and uncertain industry landscape.

2.3. Business Model Innovation

Business Model Innovation (BMI) is the process of redesigning the mechanism for value creation, delivery, and capture, enabling logistics companies to maintain relevance amid shifting market dynamics and an increasingly complex business environment (Teece, 2018). BMI serves as critical strategy for addressing evolving customer needs, enhancing efficiency, expanding market reach, developing new revenue streams, and effectively responding to technological disruptions and shifting customer preference (Teece, 2018). BMI in logistics companies three key components. First, the value proposition involves offering distinctive services, such as expedited delivery, to attract and retain customers (Li, 2025; D. J. Teece, 2018). Second, value creation focuses on optimizing operational process though advanced technology and improved internal efficiency (Li, 2025). Third, value capture incorporates dynamic pricing models or subscription-based services to secure long-term profitability (Li, 2025). By innovating in these three dimensions, logistics companies can enhance strategic agility, adapt to environmental uncertainties, and sustain a competitive advantage (Inman & Green, 2021; Li, 2025). This process not only encompasses technological advancement but also involves the reconfiguration of business processes to sustain competitiveness (Teece, 2018).

2.4. Dynamic Capability Theories

Dynamic Capability Theory emphasizes the importance of an organization's ability to adapt and innovate in response to rapid and unpredictable environmental changes (Teece, 2018). Dynamic capability adopt a process-oriented perspective on performance and acknowledge the interaction between internal and external environments (Cevallos & Sanchez, 2024). This theory is particularly relevant to the logistics industry, where companies must be highly responsive to shifting market demands, emerging technologies, and supply chain challenges. It comprises three core elements: *sensing*, *seizing*, and *transforming* (Teece, 2018). *Sensing* involves identifying opportunities and threats through market scanning, customer analysis, and exploring new technologies. *Seizing* focuses on mobilizing resources to capture the value of identified opportunities through strategic decision-making and implementing innovative strategies (Teece, 2018). T*ransforming* refers to the organization's ability to reconfigure resources maintain competitiveness (Teece, 2018). In the logistics sector, *sensing* can be achieved through continuous monitoring of market trends, while *seizing* involves developing flexible distribution networks and integrating smart technologies. *Transforming* enables companies to adopt new business models, such as *Logistics as a Service* (LaaS). Dynamic Capability Theory also posits that Absorptive Capacity – the ability to assimilate and apply external knowledge (Zahra & George, 2002) – and Strategic Agility – the ability to adapt quickly to market changes (Doz, 2020) are interconnected dynamic capabilities that drive BMI and competitive advantage (Clauss et al., 2021; D. J. Teece, 2018). These capabilities work in tandem to foster BMI and sustain-long competitiveness in the logistics industry.

2.5. Conceptual model and hypothesis

2.5.1. Absorptive capacity and strategic agility

Absorption Capacity significantly influence strategic agility in organizations, particularly in the context of increasingly complex business environment. An organization's ability to acquire, assimilate, transform, and exploit external knowledge is essential for enabling a rapid response to market changes and emerging opportunities (Zahra & George, 2002). Recent studies have demonstrated the positive interaction effect between absorptive capacity and strategic agility, showing that organization with high levels of absorptive capacity achieve greater strategic agility and profitability (Kale et al., 2019; Kohtamäki et al., 2020). Furthermore, specific dimensions of Absorptive Capacity, such as acquisition and exploitation, have been found to directly contribute to an organization's strategic agility (Tufan & Mert, 2023), with the combination of strategic agility and absorptive capacity serving as a key driver of company performance (Lungu, 2020). In conclusion, based on these findings, it is evident that absorptive capacity plays a crucial role in enhancing strategic agility, allowing organizations to respond swiftly and effectively to environmental changes and secure a competitive advantage. Therefore, the following hypothesis is proposed:

H1: Absorptive capacity has a significant positive effect on strategic agility.

2.5.2. Absorptive capacity and business model innovation

Absorptive Capacity plays a vital role in fostering BMI within organizations by enabling companies to acquire, assimilate, transform and exploit to drive innovations in their business models (Miroshnychenko et al., 2021). This capability is particularly critical in rapidly changing markets and amid evolving customer demands, as it enhances strategic flexibility and strengthens organizational resilience and competitive advantage (Bhatti et al., 2021; Miroshnychenko et al., 2021). The significance of Absorptive Capacity in BMI has been demonstrated in various industries (Miroshnychenko et al., 2021; Zeng et al., 2025). By facilitating knowledge integration and fostering cross-functional collaboration, absorptive capacity enables companies to effectively redesign or refine their business models, allowing them to capitalize on new opportunities (Bhatti et al., 2021; Miroshnychenko et al., 2021). In conclusion, these studies collectively confirm that absorptive capacity is not merely a supporting factor but a key driver of BMI, as it aligns knowledge management practices with innovation objectives to enhance organizational performance (Bhatti et al., 2021; Miroshnychenko et al., 2021). Therefore, the following hypothesis is proposed:

H2: Absorptive capacity has a significant positive effect on business model innovation.

2.5.3. Strategic agility and Business Model Innovation

Strategic agility significantly affects an organization's ability to implement BMI swiftly and effectively in response to dynamic environmental changes. By enabling companies to reconfigure key elements of BMI – value creation, value proposition, and value capture – strategic agility results in a more adaptive and competitive business model (Clauss et al., 2021). The meta-capability of Strategic Agility, which includes strategic sensitivity, resource fluidity, and collective commitment, facilities BMI by enhancing responsiveness to technological disruptions and market fluctuation (Dayioglu et al., 2024). Moreover, implementing strategic agility helps organizations overcome resource constraints and strengthens their ability to innovate in business models to withstand competitive pressures (Clauss et al., 2021). Strategic agility also drives business model expectations, leveraging existing resources to create new value in BMI (Albayraktaroglu, 2024). Thus, it functions not only as an adaptive capability but also as a key driver of business model transformation, enabling companies to generate more relevant value across dynamic market environments. Strategic agility is essential for fostering BMI, as it enhances organizational responsiveness, helps overcome resource constrains, and drives business model innovations. Therefore, the following hypothesis is proposed:

H3: Strategic agility has a significant positive effect on business model innovation.

2.5.4. Mediating role of strategic agility

Strategic Agility, an organization's ability to respond rapidly and adaptively to environmental changes (Doz, 2020), plays a crucial role in the relationship between absorptive capacity and business model innovation (BMI). While absorptive capacity provides inputs in the form of new knowledge and information (Zahra & George, 2002), strategic agility ensures that these inputs are effectively translated into innovative business model changes (Doz, 2020). Organizational flexibility and agility are essential for transforming acquired knowledge into market-relevant innovations (Teece, 2018). Previous research has demonstrated that strategic agility amplifies the impact of absorptive capacity on organizational outcomes by fostering a dynamic environment for strategic experimentation and innovation implementation (Tufan & Mert, 2023). Additionally, strategic agility helps organizations overcome internal resistance and external barriers, which often hinder the BMI process (Alkandi & Helmi, 2024). In conclusion, strategic agility serves as both a catalyst and critical mediating factor in the relationship between absorptive capacity and BMI. It enables organizations to leverage acquired knowledge and information effectively, leading to successful business model transformation in rapidly changing environments. Therefore, the following hypothesis is proposed:

H4: Strategic agility significantly mediates the effect of absorptive capacity on business model innovation.

Therefore, this study examines the relationship between Absorptive Capacity, Strategic Agility and BMI. The conceptual framework illustrating this relationship is presented in Figure 1.

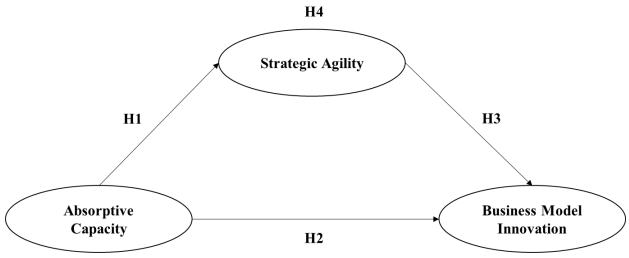


Figure 1. Conceptual framework proposed in the research (source: Author's conceptualization, 2024)

3. Methodology

This section outlines the methodological approach employed to examine the proposed research model. It describes the data collection process and the characteristics of the respondents, followed by the procedures used to evaluate the measurement model and the structural model. Finally, it explains the hypothesis testing procedures adopted to assess the proposed relationships. Together, these steps ensure the robustness and validity of the empirical analysis.

3.1. Data collection and profile of respondents

This study was conducted at the head office and several regional offices of an Indonesian state-owned logistics enterprise in Java, Indonesia. The head office was selected for its strategic authority decision-making and BMI, while the regional offices were chosen for their higher productivity compared to offices outside Java. A proportionate stratified random sampling technique was employed, with stratification based on the Head Office, Regional Office 2, Regional Office 3, Regional Office 4, and Regional Office 5. This ensured that the sample size reflected the proportion of the managerial employee population in each office. The sample size was determined in accordance with the guidelines for PLS-SEM proposed by Hair et al. (2021), which suggest a minimum sample size of 10 times the number of indicators. Given that the model includes 23 indicators, the minimum required sample size was 230 respondents. A pilot study was conducted prior to the survey to assess the validity and reliability of the measurement instruments. Three experts in the field reviewed the instrument, and no modifications were deemed necessary. Data collection was carried out through an online questionnaire using Google Form from August to October 2024. Respondents rated the provided statements on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The study obtained 434 valid responses from Head Office and Regional Offices across Java, exceeding the minimum required sample size.

Table 1 presents the respondents' profile. The majority of respondents were from Regional Office 5 (45.6%), followed by Regional Office 4 (18.4%), Regional Office 3 (14.3%), Regional Office 2 (12%), and Head Office (9.7%), reflecting the organizational structure and workforce allocation. Regarding organizational tenure, most respondents had over 10 years of experience (72.4%), with 25.3% having 6–10 years, and only 2.3% having 1–5 years. In terms of tenure in their current position, the majority had served between 1–5 years (55.3%), while 30.6% had held their current role for less than one year, suggesting ongoing managerial renewal and role rotation within the organization. In terms of educational background, most respondents held a Diploma or S1 degree (55.8%), followed by high school/vocational school graduates (38.2%), master's degree (5.8%), and PhD (0.2%). The gender distribution was skewed, with males comprising 74.2% and females 25.8%. The largest age group was 31–40 age range (44%), followed by 41–50 years (27.4%), over 50 years old (24.9%), and 20–30 years old (3.7%). These findings indicate a stable organization with a skilled and experienced workforce, given the substantial work experience and relatively high education levels. However, there are opportunities to improve gender balance and workforce regeneration by increasing the representation of younger employees.

Table 1. Respondents profile (n = 434) (source: Author's original work, 2024)

Description		Frequency	Percentage (%)
Tenure in Current Position	Less than 1 year	133	30.6
	1–5 years	240	55.3
	6–10 years	36	8.3
	More than 10 years	25	5.8
Office	Headquarter	42	9.7
	Regional Office 2	52	12.0
	Regional Office 3	62	14.3
	Regional Office 4	80	18.4
	Regional Office 5	198	45.6
Organizational Tenure	1–5 years	10	2.3
	6–10 years	110	25.3
	More than 10 years	314	72.4
Education Level	High School/Vocational School	166	38.2
	Bachelor's degree	242	55.8
	Master's degree	25	5.8
	PhD	1	0.2
Gender	Female	112	25.8
	Male	322	74.2

3.2. Method and measurement design

Data analysis was conducted using Structural Equation Modeling – Partial Least Squares (SEM-PLS) to examine the formulated conceptual model. The analysis followed a systematic procedure consistent with established PLS-SEM

guidelines (Hair et al., 2021): (1) assessment of Common Method Bias (CMB), (2) evaluation of the measurement model, (3) assessment of the structural model, and (4) hypothesis testing using bootstrapping procedures. The variable Absorptive Capacity was measured using eight items adopted from the literature (Dabić et al., 2023; Khan et al., 2019; Ma et al., 2021; Miroshnychenko et al., 2021; Sheng & Chien, 2016), covering aspects of Potential Absorptive Capacity and Realized Absorptive Capacity. The Strategic Agility variable was measured using five items from Clauss et al. (2021), evaluating the company's ability to strategically adapt to external changes and manage resources effectively. Meanwhile, BMI variable was measured using ten items from the same literature (Clauss et al., 2021), assessing the company's effectiveness in meeting customer needs, adapting to market dynamics, fostering innovation, and optimizing revenue and cost strategies.

3.2.1. Common method biased mitigation and testing

One of the techniques used to address Common Method Bias (CMB) is Harman's single-factor test (Podsakoff et al., 2003). According to Kock (2021), If the total variance extracted by a single factor exceeds 50%, it indicates the presence of CMB. This bias can arise when respondents' answers are influenced by measurement methods, such as using the same respondent for all questions or a uniform scale format. To mitigate this bias, the researcher emphasized that responses would remain confidential and there were no right or wrong answers, thereby encouraging participants to respond honestly. The Common Method Bias analysis was conducted using SPSS software. Based on the results of the Common Method Bias test using Harmon's Single Factor Test, a variance value of 48.877% was obtained. Since this value is falls below the 50% threshold, it indicates that the variance explained by a single factor does not exceed half of the total variance. Therefore, it can be concluded that Common Method Bias in this study remains under control.

3.2.2. Measurement model evaluation procedure

The measurement model testing in this study includes assessments of indicator reliability, internal consistency, convergent validity, and discriminant validity, following the guidelines of Hair et al. (2021). The reliability and validity of the measurement model were assessed using established PLS-SEM criteria. Indicator reliability was evaluated through outer loading values, with a recommended threshold of 0.70 or higher. Internal consistency reliability was assessed using Composite Reliability (CR), with values above 0.60 considered acceptable. Convergent validity was examined through the Average Variance Extracted (AVE), where a value exceeding 0.50 indicates that a construct explains more than half of the variance of its indicators. Discriminant validity was evaluated using the Heterotrait-Monotrait Ratio of Correlations (HTMT), with values below 0.90 indicating adequate discriminant validity.

3.2.3. Structural model evaluation procedure

The structural model was evaluated following established PLS-SEM procedures. Multicollinearity was assessed using the Variance Inflation Factor (VIF), with values below 5 indicating the absence of multicollinearity issues (Hair et al., 2021). Model fit was examined using the Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI). An SRMR value below 0.08 indicates good model fit, while higher NFI values suggest better model adequacy (Hair et al., 2021). The model's explanatory power was assessed using the coefficient of determination (R^2), which indicates the proportion of variance in the endogenous constructs explained by the exogenous variables (Hair et al., 2021).

3.2.4. Hypothesis testing

Hypotheses were tested using bootstrapping with 5,000 resamples in SmartPLS. Path coefficients were considered significant when t-values exceeded 1.645 (one-tailed, 5% level) and p-values were below 0.05 (Hair et al., 2021). Mediating effects were assessed using bootstrapping with 5,000 resamples and a 95% confidence interval in SmartPLS, following Preacher and Hayes (2008) and Hair et al. (2021). An indirect effect was considered significant when the confidence interval excluded zero. The type of mediation was determined based on the significance of direct and indirect effects (Zhao et al., 2010). The magnitude of mediation was evaluated using the Variance Accounted For (VAF). VAF represents the proportion of the total effect that is explained by the indirect effect. It is computed by dividing the indirect effect by the total effect. VAF value below 20% indicates no mediation, a value between 20% and 80% suggests partial mediation, and a value above 80% indicates full mediation (Gentle et al., 2010).

4. Results

This section presents the empirical findings of the study. The analysis was performed in three sequential stages. First, the measurement model was evaluated to assess reliability and validity. Second, the structural model was tested to examine the relationships among constructs. Third, hypothesis testing was performed to evaluate the proposed research hypotheses.

4.1. Results of measurement model testing

The measurement model was evaluated to assess indicator reliability, internal consistency, convergent validity, and discriminant validity, are presented in Table 2 and Table 3.

Based on Table 2, all indicator loadings ranged from 0.711 to 0.832. These values exceed the recommended threshold of 0.70, confirming indicator reliability. Composite Reliability (CR) values were 0.894 for Absorptive Capacity, 0.859 for Strategic Agility, and 0.919 for Business Model Innovation. Each CR value surpasses the acceptable level of 0.60, indicating strong internal consistency.

Table 2. Measurement model test results (source: data processed, 2024)

Variable	Code	Loading Factor	CR	AVE
Absorptive Capacity (AC)	AC1	0.719	0.894	0.567
	AC2	0.714		
	AC3	0.731		
	AC4	0.721		
	AC5	0.782		
	AC6	0.800		
	AC7	0.802		
	AC8	0.748		
Strategic Agility (SA)	SA1	0.810	0.859	0.640
	SA2	0.839		
	SA3	0.812		
	SA4	0.761		
	SA5	0.776		
Business Model Innovation (BMI)	BM1	0.713	0.919	0.575
	BM2	0.799		
	BM3	0.729		
	BM4	0.767		
	BM5	0.832		
	BM6	0.729		
	BM7	0.818		
	BM8	0.758		
	BM9	0.717		
	BM10	0.711		

Note: CR: Composite Reliability, AVE: Average Variance Extracted.

Table 3. Discriminant validity HTMT ratio (source: denoted by Authors, 2024)

	AC	BMI	SA
AC	–	–	–
BMI	0.776	–	–
SA	0.844	0.891	–

Note: AC: Absorptive Capacity, SA: Strategic Agility, BMI: Business Model Innovation.

Average Variance Extracted (AVE) values were 0.567, 0.640, and 0.575, respectively. All AVE values exceed the minimum requirement of 0.50, supporting convergent validity. Table 3 shows HTMT values of 0.779 between BMI and Absorptive Capacity, 0.851 between Strategic Agility and Absorptive Capacity, and 0.891 between Strategic Agility and BMI. Each value remains below the recommended threshold of 0.90, confirming the constructs are empirically distinct. Overall, the results indicate the measurement model meets established reliability and validity criteria.

4.2. Results of structural model testing

Following the assessment of the measurement model, the structural model was evaluated in several stages. First, multicollinearity was examined using the Variance Inflation Factor (VIF). The results indicate that all VIF values ranged from 1.754 to 2.730, which are below the recommended threshold of 5, demonstrating that multicollinearity is not a concern in this study. After confirming the absence of multicollinearity, the overall model fit was evaluated using the Standardized Root Mean Square Residual (SRM) and Normed FIT Index (NFI), as presented in Table 4.

Table 4. Inner model test results (source: created by Authors, 2024)

Goodness of Fit	Estimated Model
SRMR	0.060
NFI	0.833

Based on Table 4, the SRMR value of 0.060 falls below the recommended cut-off of 0.08, indicating good model fit. The NFI value of 0.833 approaches the suggested benchmark of 0.90, suggesting an acceptable level of model fit, although further refinement may enhance model performance. Following the evaluation of model fit, the structural model evaluation was further assessed using the coefficient of determination (R-square values), as presented in Table 5.

Table 5. R-square values (source: created by Authors, 2024)

Inner Model	R-square
BMI	0.659
SA	0.563

Note: AC: Absorptive Capacity, SA: Strategic Agility, BMI: Business Model Innovation.

The R-square value of 0.659 for BMI and 0.563 for strategic agility indicates that 65.9% of the variance in BMI and 56.3% of the variance in strategic agility can be explained by the independent variables in the model. These results demonstrate that the model has satisfactory explanatory power and is appropriate for hypothesis testing.

4.3. Hypothesis testing results

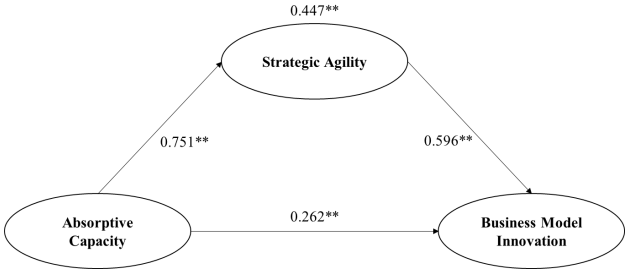
The hypothesis testing results in this study were evaluated by examining the significance values of the path coefficients, as presented in Table 6.

Table 6. Hypothesis test result (source: Author's original work, 2024)

Hypothesis	Path	Path coefficient	Standard deviation	T– statistics	P-values	Remarks
H1	AC → SA	0.751	0.026	28.388	0.000	Supported
H2	AC → BMI	0.262	0.055	4.778	0.000	Supported
H3	SA → BMI	0.596	0.054	11.009	0.000	Supported
H4	AC → SA → BMI	0.447	0.044	10.277	0.000	Partial mediation

Note: AC: Absorptive Capacity, SA: Strategic Agility, BMI: Business Model Innovation.

To enhance clarity, the information in Table 6 is graphically represented in Figure 2.



Notes: **: p.value < 0.01.

Figure 2. Hypothesis test result (source: Author's original work, 2024)

Based on Table 6 and Figure 2, the hypothesis testing results indicate that absorptive capacity has a positive and significant effect on strategic agility (H1: 0.751, t = 28.388, p < 0.05), leading to the acceptance of H1. Similarly, absorptive capacity has a positive and significant effect on BMI (H2: 0.262, t = 4.778, p < 0.05), confirming the acceptance of H2. Additionally, strategic agility has a positive and significant influence on BMI (H3: 0.596, t = 11.009, p < 0.05), supporting H3. Furthermore, strategic agility is found to partially mediate the relationship between absorptive capacity and BMI (H4: 0.447, t = 10.277, p < 0.05), leading to the acceptance of H4. To further assess the magnitude of this mediation effect, the Variance Accounted For (VAF) was calculated. The total effect (0.709) comprises both the direct (0.262) and indirect (0.447) effects, resulting in a VAF value of 63%. As this value falls between 20% and 80%, the mediation is therefore classified as partial.

5. Discussion

This study provides empirical support for the first hypothesis (H1), which posits that absorptive capacity has a positive and significant influence on strategic agility. These findings indicate suggests that the greater a logistics company's ability to acquire, assimilate, transform, and exploit external knowledge, the stronger its capacity to identify market opportunities and threats and respond swiftly to environmental changes. These results are consistent with prior research highlighting the link between knowledge-based capabilities and agility (Kale et al., 2019; Kohtamäki et al., 2020). Kale et al. (2019) demonstrate that both the knowledge acquisition and knowledge use dimensions of absorptive capacity positively affect strategic agility, positioning agility as an outcome of effective knowledge-processing routines in the hospitality sector. Similarly, Kohtamäki et al. (2020) argue that firms with stronger knowledge integration capabilities are better able to engage in strategic renewal and adaptive reconfiguration, reinforcing the role of absorptive capacity in fostering agility-oriented strategic behavior. In the logistics context, where firms operate under rapid technological change and evolving customer demands, the ability to detect market trends, adopt digital technologies, and leverage data analytics becomes critical for sustaining competitive advantage (Akhtar et al., 2024; Alsmairat & AL-Shboul, 2023; Ávila, 2022; Tiwari et al., 2024). By fostering absorptive capacity, logistics companies can more effectively recognize opportunities and threats, implement timely strategic actions, and develop innovative solutions to complex logistics challenges (Gölgeci & Kuivalainen, 2020).

The results also support the second hypothesis (H2), stating that absorptive capacity positively and significantly influences BMI, confirming that firms with stronger capabilities to acquire, assimilate, transform, and exploit external knowledge are more likely to develop and implement innovative business models. This finding suggests that knowledge absorption extends beyond learning processes and translates into tangible business model transformation. The results are consistent with prior research demonstrating the role of absorptive capacity in fostering BMI across different contexts (Bashir et al., 2024; Bhatti et al., 2021; Miroshnychenko et al., 2021). For example, Bhatti et al. (2021) identified its contribution to BMI in the IT industry, while Miroshnychenko et al. (2021) found that realized absorptive capacity – arising from the transformation and exploitation of acquired knowledge – positively affects BMI in Italian SMEs. These findings align with the theoretical perspective that absorptive capacity functions as a strategic learning capability enabling organizations to detect emerging market opportunities, adopt new technologies, and integrate external knowledge into strategic renewal processes (Bashir et al., 2024). Within the logistics context, this capability becomes particularly critical due to the dynamic, digitally coordinated, and interdependent nature of supply chain networks. Firms operating in such environments must continuously process external knowledge to redesign value propositions and realign resources across network partners. Prior studies indicate that absorptive capacity strengthens interorganizational collaboration and facilitates joint value creation, thereby supporting adaptive service innovation and business model transformation (Gölgeci & Kuivalainen, 2020; Salam & Bajaba, 2023). Consequently, firms with higher absorptive capacity are better positioned to respond to environmental turbulence and sustain competitive advantage through ongoing business model transformation, positioning absorptive capacity not merely as a knowledge management capability but as a strategic mechanism for enhancing adaptability in logistics organizations.

The results also support the third hypothesis (H3), indicating that strategic agility positively and significantly influences BMI. The findings suggest that a logistics company's ability to adapt swiftly to changes in the business environment enables it to effectively create, implement and refine business models that remain relevant to market dynamics. Strategic agility allows companies to balance flexibility and stability, which are fundamental to BMI (Doz, 2020; D. J. Teece, 2018). These results are consistent with prior research (Albayraktaroglu, 2024; Clauss et al., 2021; Dayioglu et al., 2024). Albayraktaroglu (2024) shows that

strategic agility – through strategic sensitivity and resource fluid it – facilitates resource reconfiguration and the development of new value proposition. Clauss et al. (2021) further argue that strategic agility enables firms to continuously adapt how they create, deliver, and capture value in dynamic environments. Similarly, Dayioglu et al. (2024) show that technological turbulence activates strategic sensitivity and resource fluidity, which subsequently drive BMI and corporate performance in an emerging economy context. Building on these insights, the present study extends the agility–BMI relationship to the logistics industry, where rapid technological advancements – such as e-logistics and digitally integrated supply chain systems – intensified the need for adaptive capabilities. By fostering strategic agility, logistics companies can effectively integrate emerging technologies, including the Internet of Things (IoT), artificial intelligence (AI), and blockchain, to enhance operational efficiency and customer experience (Akhtar et al., 2024; Kalkha et al., 2023). Moreover, strategic agility strengthens supply chain resilience when combined with absorptive capacity, allowing companies to assimilate and apply external knowledge effectively (Abourokbah et al., 2023; Salam & Bajaba, 2023). In network-intensive logistics environments, however, BMI does not emerge from isolated strategic redesign. Rather, it requires synchronized coordination among carriers, warehouses, digital platforms, and customers. In this context, strategic agility functions not merely as a strategic decision-making capability but as an operational orchestration capability that enables real-time reconfiguration of distribution networks and service configurations. This highlights the industry-specific nature of logistics BMI, where agility is deeply intertwined with supply chain alignment and ecosystem-level collaboration.

The findings of this study empirically support the fourth hypothesis (H4), which posits that absorptive capacity indirectly influences BMI through strategic agility as a partial mediator. This suggests that acquisition and assimilation of external knowledge alone are insufficient to drive business model innovation unless firms possess the agility required to translate that knowledge into strategic reconfiguration. In line with dynamic capability theory, which emphasizes internal transformation as the foundation of innovation (Zahra & George, 2002; Teece, 2018), strategic agility functions as the activation mechanism through which absorptive capacity is converted into business model renewal. This insight is particularly germane to the logistics industry, where the integration of digital technologies such as the Internet of Things (IoT), artificial intelligence (AI), and blockchain is increasingly prevalent (Kalkha et al., 2023). While absorptive capacity enables firms to recognize and internalize technological opportunities, successful BMI implementation requires strategic agility to rapidly mobilize resources and reconfigure value creation and delivery systems (Abourokbah et al., 2023; Clauss et al., 2021). Consequently, logistics companies must develop both absorptive capacity and strategic agility simultaneously, as their synergy enhances operational efficiency, customer experience, and long-term competitiveness in the dynamic global markets. More importantly, the mediating role of strategic agility reveals an industry-specific BMI mechanism within coordination-intensive logistics ecosystems. In tightly coupled supply chain structures, knowledge absorption does not automatically translate into innovation unless accompanied by rapid network-level adjustment and synchronized resource alignment. Strategic agility therefore operates not merely as a firm-level adaptive capability, but as a real-time coordination mechanism that transforms absorbed knowledge into adaptive service architectures, reconfigured distribution networks, and digitally enabled value propositions. This coordination-embedded mediation mechanism distinguishes logistics BMI from innovation processes observed in less interdependent sectors and contributes to a network-oriented refinement of dynamic capability theory, suggesting that the effectiveness of dynamic capabilities is contingent upon ecosystem interdependence and coordination intensity.

While this study advances understanding the mediating role of strategic agility in linking absorptive capacity to BMI, several avenues for future research emerge. First, explicating this model across multiple logistics firms or extending it to other industries would enhance generalizability and enable comparative analysis of coordination intensity across sectors. Seconds, longitudinal designs would allow scholars to capture the temporal evolution of absorptive capacity, strategic agility, and BMI, thereby providing deeper insight into dynamic capability development processes. Third, incorporating external contingencies – such as competitive intensity, regulatory turbulence, or technological disruption – could further clarify boundary conditions affecting the mediation mechanism. Finally, given the accelerating pace of digital transformation in logistics, future studies may explore how emerging technologies, including big data analytics, artificial intelligence (AI), and blockchain, interact with dynamic capabilities to amplify or reshape business model innovation trajectories.

6. Study's implications

This section discusses the findings in relation to the theoretical framework and prior studies. It elaborates on the theoretical and practical implications of the results and highlights how the findings contribute to the understanding of dynamic capabilities in the logistics industry.

6.1. Theoretical implications

This study expands the theoretical understanding of Dynamic Capability Theory by investigating the mediating role of strategic agility in the relationship between absorptive capacity and BMI in the Indonesian state-owned logistics industry. While the existing literature establishes that dynamic capabilities enable companies to adapt to changing environments by developing strategic and responsive competencies (Teece, 2018), empirical research on the interaction between different dynamic capabili-

ties, particularly in developing countries like Indonesia, is scarce. The findings demonstrate that absorptive capacity influences BMI not only directly but also indirectly by enhancing strategic agility. This aligns with the core tenet of Dynamic Capability Theory, which posits that dynamic capabilities interact and complement each other to generate value and sustainable competitive advantage (Teece, 2007, 2018). By broadening the theoretical scope and providing empirical evidence from Indonesian state-owned logistics industry, this study makes a significant contribution to the understanding of how different dynamic capabilities work together to drive innovation and competitiveness.

This study bolsters the validity of dynamic capability theory by empirically demonstrating the pivotal roles of absorptive capacity and strategic agility as key dynamic capabilities in driving BMI. In the rapidly transforming logistics industry, shaped by technology disruption and e-commerce expansion, these capabilities are crucial for effective adaptation and innovation. While prior research has established the role of absorptive capacity in fostering innovation (Bhatti et al., 2021; Miroshnychenko et al., 2021) and strategic agility in enhancing organizational flexibility (Clauss et al., 2021; Ganguly et al., 2024), this study uniquely contributes by examining strategic agility's partial mediating effect on the relationship between absorptive capacity and BMI. This expands dynamic capability theory's application by elucidating how dynamic capabilities interact to drive innovation in rapidly evolving business environments (Li, 2025). Furthermore, this study extends dynamic capability theory's generalizability by exploring its relevance in the Indonesian logistics industry, a developing economy with distinct business dynamics. The findings demonstrate the theory's fundamental principles can be effectively applied across industries and economic context, reinforcing its theoretical robustness and practical applicability.

This study advances Dynamic Capability Theory by demonstrating that the interaction between absorptive capacity and strategic agility operates through an industry-contingent coordination mechanism in the logistics sector. While prior research has largely treated these capabilities as higher-order strategic competencies influencing innovation outcomes (Tufan & Mert, 2023), our findings show that in network-intensive logistics environments, their effectiveness depends on real-time operational reconfiguration and digitally orchestrated supply chain coordination. Unlike industries where business model innovation can rely primarily on internal strategic redesign, logistics BMI is embedded within tightly coupled distribution networks and platform-based coordination structures. Thus, dynamic capabilities function as embedded coordination mechanisms shaped by ecosystem interdependence. The partial mediating role of strategic agility further indicates that absorptive capacity alone is insufficient; knowledge absorption must be complemented by agile orchestration to translate external insights into adaptive service architectures and network-level transformation.

6.2. Practical implications

To enhance competitiveness, logistics companies must strengthen their absorptive capacity and strategic agility through strategic initiatives. Enhancing knowledge absorptive capacity can be achieved by fostering an organizational learning culture, investing in technology-based training, establishing internal innovation centres, and collaborating with academia and technology providers. Implementing strategic agility requires adopting flexible organizational restructuring, accelerating decision-making processes, and simplifying operational procedures to minimize bureaucratic obstacles. These measures enable companies to adapt swiftly to industry changes and effectively integrate new insights into their business operations.

The adoption of digital technologies such as big data analytics, artificial intelligence (AI), and blockchain is crucial for driving business model innovation in the logistics sector. These technologies optimize supply chain efficiency, improve digital-based customer service, and enhance market demand forecasting accuracy. Additionally, logistics ecosystem collaboration plays a vital role in building sustainable competitive advantage. Strengthening partnerships with transportation service providers, suppliers, and regulators fosters business innovation synergies and enhances operational efficiency. Lastly, implementing data-driven risk management strategies enables companies to anticipate market uncertainties through real-time monitoring systems and data-driven evaluations. By adopting a structured approach, logistics firms can enhance competitiveness and achieve sustainable business growth amidst evolving industry dynamics.

7. Conclusions

This study examines the mediating role of strategic agility in the relationship between absorptive capacity and business model innovation within the Indonesian logistics industry. The findings demonstrate that absorptive capacity significantly enhances both strategic agility and BMI, while strategic agility partially mediates this relationship. These results confirm that knowledge acquisition and integration alone are insufficient for sustained innovation unless translated into adaptive and coordinated strategic action.

The study contributes to dynamic capability theory by highlighting how absorptive capacity and strategic agility interact within a network-intensive and operationally embedded logistics context. In this industry, business model innovation is closely tied to supply chain coordination, digital integration, and ecosystem orchestration, underscoring the importance of capability alignment in transforming knowledge into adaptive business models. From a managerial perspective, the findings suggest that logistics firms should simultaneously invest in strengthening knowledge absorption mechanisms and fostering strategic agility through flexible organizational structures, digital capability development, and cross-functional coordination.

Despite its contributions, this study has several limitations. First, the focus on a single Indonesian state-owned logistics enterprise may limit the generalizability of the findings. Second, the cross-sectional survey design restricts causal inference and does not capture dynamic capability evolution over time. Third, the model does not incorporate external environmental contingencies that may influence the absorptive capacity–BMI relationship. These limitations open opportunities for future research to extend the model across industries, countries, and longitudinal settings.

Overall, this study underscores that in network-based logistics environments, the synergy between absorptive capacity and strategic agility plays a crucial role in sustaining business model innovation and maintaining competitiveness in the digital era.

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Author contributions

N. A. conceived the study, was responsible for the design and development of the data analysis, and collected and analyzed the data. N. A. also wrote the main sections of the journal as the corresponding author. R. R. contributed to data collection and provided expertise in the analysis and conceptualization of management theories. N. K. I. was responsible for designing the research methodology and contributed to data interpretation. S. P. P. provided expertise in management analysis, conceptual development, and data interpretation. N. A. wrote the first draft of the article. All authors reviewed and approved the final manuscript.

Disclosure statement

The authors declare that there are no competing financial, professional, or personal interests that could have influenced the work reported in this article.

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