APTISI Transactions on Technopreneurship (ATT)
Vol. 8, No. 2, July 2026, pp. 645−658
E-ISSN: 2656-8888 | P-ISSN: 2655-8807, DOI:10.34306

Enhancing Digital Fashionpreneurship Through Innovation Capability and Market Sensing

Santa Lusianna Sitorus[1*], Asep Hermawan[2], Anton Wachidin Widjaja[3], Margaretha Pink Berlianto[4]
[1,4]Faculty of Economics and Business, Pelita Harapan University, Indonesia
[2]Faculty of Economics and Business, Universitas Trisakti, Indonesia
[3]Faculty of Economics and Business, President University, Indonesia
[1]stlusi@gmail.com, [2]azep17@gmail.com, [3]antonwachidinwidjaja@gmail.com, [4]margaretha.berlianto@uph.edu
***Corresponding Author**

Article Info

Article history:

Submission May 17, 2025
Revised August 11, 2025
Accepted March 9, 2026
Published May 28, 2026

Keywords:

Intellectual Capital
Innovation Capability
Market Sensing Capability
Firm Performance

ABSTRACT

This study aims to examine the influence of intellectual capital and Market Sensing Capability (MSC) on business performance, with innovation capability serving as a mediating variable. **This research** examines fashion brand enterprises that function online in Indonesia. The conceptual framework employed is a novel model derived from previous research, highlighting the role of intellectual capital and MSC in enhancing business performance via the strategic mediation of innovation capability. **This study utilizes** a quantitative methodology employing the PLS-SEM technique to examine the causal links among latent constructs. Data were collected by the dissemination of closed questionnaires to online fashion brand enterprises represented by owners, directors, or managers. Through purposive sampling, 124 respondents were acquired and deemed valid for analysis. **This study has** seven hypotheses to evaluate the direct and indirect impacts of the constructs on organizational performance. **The results** affirm that innovation capability significantly mediates the relationship between intellectual capital and firm performance, as well as between MSC and firm performance. This study enhances the academic discourse on organizational capabilities and provides pragmatic insights for the management of strategic resources within the digital marketplace, specifically in the fashion sector.

DOI: https://doi.org/10.34306/att.v8i2.721

1. INTRODUCTION

In today's competitive business environment, intellectual capital, Market Sensing Capability (MSC), and innovation capability play a crucial role in driving a firm's performance [1]. The fashion industry in Indonesia has experienced rapid growth, propelled by both domestic brands and international competitors. However, the sector faces challenges, including shifts in consumer behavior and increasing competition from global brands. These challenges emphasize the importance of leveraging intellectual capital and market sensing to improve business performance [2, 3].

Intellectual capital, which encompasses human, structural, and relational capital, significantly contributes to performance by fostering innovation, increasing operational efficiency, and facilitating collaboration [4]. MSC, on the other hand, enables companies to anticipate market demands and track competitor actions,

allowing them to seize opportunities and mitigate risks [5]. Innovation capability serves as a key mediator between intellectual capital, market sensing, and firm performance, especially in a dynamic and rapidly changing market environment [6].

This research applies the Resource-Based View (RBV) and dynamic capability theories to investigate how firms can capitalize on intangible assets, like intellectual capital and market sensing, to enhance their performance [7]. Previous studies have established that intellectual capital positively affects performance, although its impact varies across its different dimensions [8]. Market sensing also plays a vital role in boosting performance, although its effects may differ under various circumstances [9, 10].

In Indonesia's fashion industry, where local brands face intensifying competition from multinational corporations, strengthening intellectual capital, market sensing capability, and innovation capability has become increasingly essential for achieving and sustaining a competitive advantage [11]. These capabilities enable firms not only to optimize internal resources but also to respond proactively to rapid changes in consumer preferences, technological advancements, and digital market dynamics. This study addresses a critical gap in the existing literature by examining how innovation capability mediates the relationship between intellectual capital, market sensing, and firm performance, particularly within the context of digital fashion enterprises [12]. By focusing on this mediating mechanism, the research provides a deeper understanding of how firms can transform knowledge-based resources and market insights into tangible performance outcomes. Additionally, this research contributes to the global agenda of the United Nations Sustainable Development Goals, specifically SDG 8, by emphasizing the role of innovation and digital entrepreneurship in fostering sustainable economic growth, enhancing productivity, and strengthening competitiveness in emerging markets [13, 14]. Furthermore, the paper introduces a comprehensive conceptual model that highlights the strategic role of innovation capability as a key mediating variable, offering new theoretical and empirical insights into its impact on firm performance in the evolving fashion sector [15].

2. LITERATURE REVIEW

2.1. Theoretical Foundation

The Resource-Based Theory (RBT) emphasizes that a firm's unique resources and capabilities form the foundation for sustained competitive advantage. Barney's VRIN framework (valuable, rare, inimitable, non-substitutable resources) plays a crucial role in corporate performance by generating economic rent. RBT highlights both physical (e.g., technology, cash) and intangible resources (e.g., reputation, knowledge) as essential for competitive positioning and performance [16, 17]. Meanwhile, Dynamic Capability Theory (DCT) expands this idea by focusing on a firm's ability to adapt and reallocate resources in response to changing market conditions. DCT emphasizes flexibility as key to maintaining competitive advantage in fluctuating environments. Together, these theories offer complementary perspectives on how firms leverage internal resources like intellectual capital, market sensing, and innovation to maintain long-term competitiveness [18].

2.2. Hypothesis Development

- Intellectual Capital and Innovation Capability
  Intellectual capital is a key intangible asset that boosts an organization's innovation capacity. By leveraging information, talent, and networks, firms can develop new products, processes, and services that enhance consumer value and competitive advantage [19, 20]. The relationship between intellectual capital and innovation capability is central in strategic management literature, especially in understanding how human, structural, and relational capital contribute to innovation [21]. Previous studies have confirmed a significant positive link between intellectual capital and innovation capability, indicating that intellectual capital is both a facilitator and a prerequisite for successful innovation [22, 23]. Based on these findings, the following hypothesis was formulated:

  H1: Intellectual Capital has a positive influence on Innovation Capability.

- MSC and Innovation Capability
  Market sensing is crucial for enhancing a company's innovation capacity. It involves gathering, analyzing, and using market data to identify and respond to changes in consumer preferences, trends, and competition [24]. This ability helps firms stay responsive and adjust their strategies accordingly. Innovation capability refers to a company's skill in developing new products, services, or processes, requiring creativity, problem-solving, and risk management [25]. Market sensing enables firms to identify new

innovation opportunities, adjust innovation strategies, and mitigate risks [26]. Based on these insights, the following hypothesis was formulated:

H2: MSC has a positive influence on Innovation Capability.

- Intellectual Capital and Firm's Performance
  Intellectual capital (IC), which includes human, structural, and relational capital, plays a critical role in shaping corporate performance, particularly in knowledge-intensive industries like fashion [27]. Human capital, representing the knowledge and creativity of employees, significantly drives innovation and efficiency [28]. Structural capital, including organizational processes and systems, supports performance by fostering operational efficiency and innovation. Relational capital, which encompasses relationships with stakeholders like customers and suppliers, enhances competitive advantage through trust and collaboration [29]. Research shows a positive link between IC and organizational performance, with firms possessing strong IC typically achieving superior results, especially in financial metrics such as ROI and market share. However, the impact of IC components varies; human capital has a more direct effect on innovation, while structural and relational capital improve operational efficiency and market positioning [30]. Based on these insights, the following hypothesis was formulated:

  H3: Intellectual Capital has a positive influence on Firm's Performance.

- MSC and Firm's Performance
  MSC refers to a firm's ability to identify, analyze, and respond to market fluctuations, which is key to achieving strong firm performance [31]. MSC allows companies to gather market intelligence on customer preferences, competition, and trends, driving innovation and strategic decisions [32]. In the fast-evolving fashion industry, MSC is essential for staying responsive to changing consumer demands and trends, enhancing customer satisfaction and retention [33]. MSC also fosters higher profitability and market growth by enabling firms to capitalize on emerging opportunities and threats. A firm's ability to successfully identify and act on market opportunities directly influences its competitive edge and long-term success [34, 35]. Based on these insights, the following hypothesis was formulated:

  H4: MSC has a positive influence on Firm's Performance.

- Innovation Capability and Firm's Performance
  Innovation capabilities, particularly in business planning and R&D, are crucial for a company's success, especially when supported by effective government policies [36]. Research highlights that government support significantly strengthens the link between a firm's internal innovation capabilities and its overall performance [37]. Studies show a positive correlation between innovation skills and organizational success, emphasizing the importance of external support in fostering innovation. Additionally, research on Vietnamese retailers confirms that enhancing innovation potential is vital for improving performance [38]. Based on these findings, the following hypothesis was formulated:

  H5: Innovation Capability has a positive influence on Firm's Performance.

- Innovation Capability as a Mediating Role in Firm's Performance
  Innovation capability plays a crucial role in enhancing business performance by converting intellectual capital and resources into innovative products, processes, and services that meet market demands [39]. It enables firms to adapt to competitive shifts, whether through product development, technological advancements, or improved operational efficiency. Innovation capability bridges the gap between internal resources, such as intellectual capital and market sensing capabilities, and external performance outcomes [40, 41]. Firms with strong innovation capabilities can turn knowledge and skills into new market offerings, boosting customer satisfaction, market share, and profitability [42]. Research shows that innovation capability mediates the relationship between intellectual capital and firm performance, fostering continuous innovation and competitive advantage. It also mediates the impact of market sensing on performance by helping firms transform market data into innovation strategies [43]. In doing so, innovation capability enhances the role of a firm's internal resources and market insights, driving sustained growth and competitiveness. Based on these insights, the following hypotheses were formulated:

  H6: Innovation Capability mediates the effect of Intellectual Capital on Firm Performance.
  H7: Innovation Capability mediates the effect of MSC on Firm Performance.

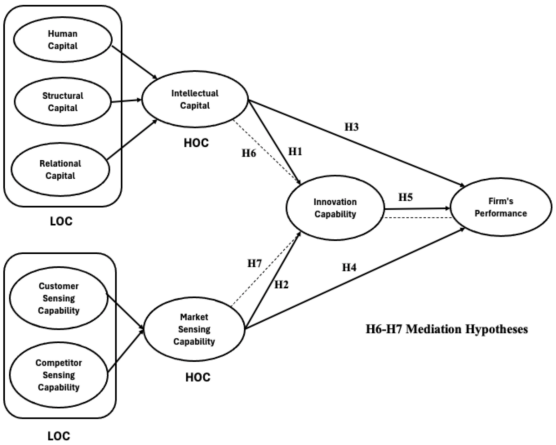

Figure 1. Conceptual Framework (self-developed by authors, adapted from RBV and Dynamic Capability Theory literature)

The conceptual framework in Figure 1 shows the relationship between intellectual capital, market sensing capability, innovation capability, and firm performance. Intellectual capital and market sensing capability are expected to directly improve firm performance and also enhance innovation capability. Innovation capability acts as a mediating variable that transforms internal resources and market insights into better business performance. Thus, the framework reflects the integration of RBV and Dynamic Capability Theory in explaining the seven hypotheses of this study.

3. RESEARCH METHODS

3.1. Sampling and Data Collection

This study adopts a cross sectional quantitative design and applies Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the hypothesized causal relationships among latent constructs [44, 45]. The empirical context is Indonesian fashion-brand enterprises operating online via Shopee, Lazada, Tokopedia, Instagram, and TikTok an environment characterized by rapid technological change and intense competition that makes continuous innovation strategically salient. A purposive sampling strategy was used to reach key informants who are accountable for strategic and operational decisions (owners, directors, or managers). A structured self administered questionnaire was distributed electronically between January and February 2025. Prior to fielding, the instrument underwent content checks for clarity and relevance. Responses were screened for completeness, duplicates, and patterned answering; after screening, 124 valid cases were retained for analysis [46, 47].

All constructs were measured reflectively using multiple indicators on a five point Likert scale (1 = strongly disagree to 5 = strongly agree). PLS-SEM was chosen due to its suitability for prediction-oriented research, handling complex models with latent variables, and working well with non-normal data [48, 49]. An a priori power analysis (two-tailed, medium effect) indicated that a minimum of 116 observations would achieve statistical power of 0.90; the final sample of 124 exceeds this threshold and is adequate for model estimation [50]. The analysis followed a two-stage procedure, beginning with the assessment of the measurement model, which examined indicator reliability (outer loadings), internal consistency, as well as convergent and discriminant validity, and continued with the evaluation of the structural model, which included testing multicollinearity (inner VIF), path coefficients, effect sizes, predictive relevance, and indirect (mediated) effects using nonparametric bootstrapping with 5,000 resamples. Where appropriate, firm characteristics such as size, age, and number of sales platforms were included as control variables, while participation remained voluntary, with respondents providing informed consent and all data being anonymized to ensure confidentiality.

3.2. Instruments and Measurements

The research constructs were adapted from previous studies. Intellectual capital was assessed through three dimensions: human capital (five indicators related to employee skills and abilities), structural capital

(seven items on non-physical assets supporting operations), and relational capital (five items focused on knowledge from internal and external relationships). MSC was evaluated through two dimensions: customer sensing (six indicators on attracting and retaining customers) and competitor sensing (six items on identifying competitors and discovering value opportunities). Innovation capability was assessed using six items related to product, service, and process innovation. Firm performance was measured with five financial indicators and four non-financial items to assess competitive position.

The survey was divided into three sections: demographic questions (job title, staff count, business category, online platforms, operational duration, and monthly sales), a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to assess intellectual capital, market sensing, and innovation capability, and a three-point Likert scale (1 = not superior, 2 = equally superior, 3 = more superior) to evaluate firm performance. The use of different scales was intentional: the five-point scale captured perception variability, while the three-point scale simplified performance comparisons and minimized bias in self-assessment.

3.3. Data Analysis

This study uses PLS-SEM with SmartPLS 4.1.0.9 to analyze the relationships among variables. PLS-SEM is selected for its flexibility and statistical power in predictive, theory-building research involving complex models, small-to-medium sample sizes, and formative-reflective constructs. Compared to covariance-based SEM, it is better suited for handling mediation and higher-order constructs, enhancing methodological rigor and aligning with the exploratory nature of the study. A disjoint two-stage approach was applied to accurately estimate higher-order constructs (HOC) while avoiding multicollinearity and redundancy. The first stage evaluates lower-order constructs (LOC) to generate latent variables for the second stage, which assesses both outer and inner models. The analysis focuses on the reliability and validity of the reflective construct for LOC and the formative construct for HOC, while also evaluating the structural model through R^2, f^2, Q^2, and path coefficients.

4. RESULT AND DISCUSSION

4.1. Distribution of the Respondents

Table 1. Respondents profile

Item	Description	Frequency	Percent
Gender	Male	65	52
	Female	54	44
Job Position	Owner	59	48
	Director	7	6
	Senior Manager	23	19
	Junior Manager	40	32
Number of Employees	<20	85	69
	20–99	20	16
	100–249	14	11
	250–500	4	3
	>500	1	1
Platform Online	Shopee	88	42
	Tokopedia	44	21
	Lazada	14	7
	Instagram	37	17
	TikTok	23	11
	(Zalora, FB, Web)	6	3
Number of Platform Online	1 Platform	66	53
	2 Platform	35	28
	3 Platform	14	11
	>4 Platform	9	7
Period of Business (year)	1–4 th	84	68
	5–9 th	34	27
	10–15 th	6	5
Business Fashion Category	Women	44	35
	Men	42	34
	Children	7	6

	Men and Women	20	16
	Women and Children	2	2
	Men and Children	1	1
	Men, Women and Children	8	6
Monthly Revenues (in million rupiah)	< 10	38	31
	10–29	19	15
	30–50	17	14
	50–90	18	15
	> 100	32	26

The demographic profile shows a balanced gender distribution, with 52% male and 48% female respondents. Most participants were business owners (44%), followed by junior managers (32%), senior managers (19%), and directors (6%). The majority of firms were small enterprises, with 69% employing fewer than 20 workers, and most had operated online for 1–4 years (68%). Shopee was the most widely used platform (71%), followed by Tokopedia, Instagram, and TikTok Shop. Over half of the firms (53%) used only one platform, while those utilizing multiple platforms tended to achieve higher revenues, with 26% earning over IDR 100 million monthly. The respondent profile is presented in Table 1.

4.2. First Stage in Disjoint Two-Stage Approach Outer Model Lower Order Construct (LOC)

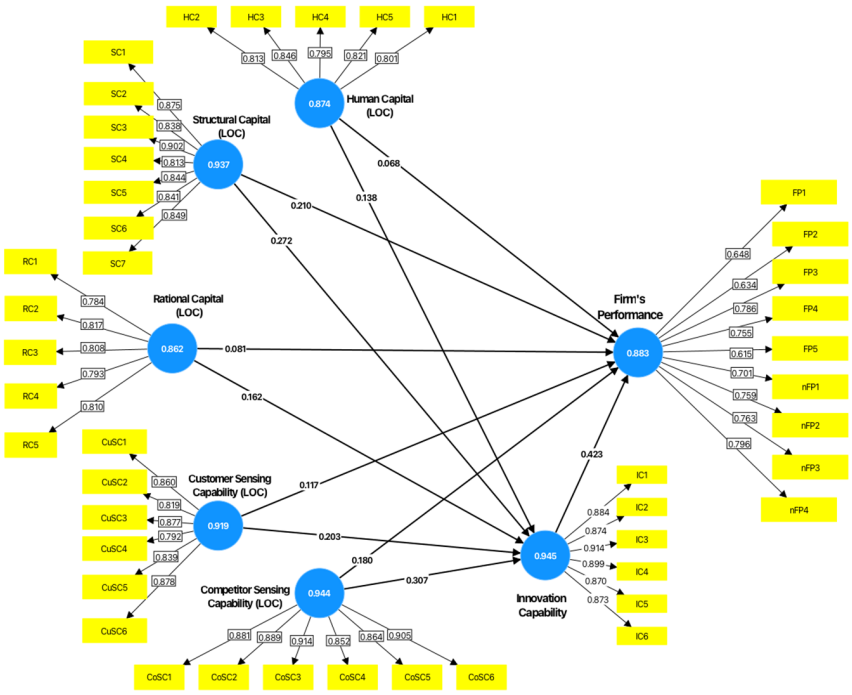

Figure 2. Outer Model Lower Order Component

As illustrated in Figure 2, the SmartPLS 4 outer model shows that most indicator loadings exceed 0.70, indicating strong reliability. Within the firm performance construct, FP1 (0.648), FP2 (0.634), and FP5 (0.615) fall slightly below 0.70 yet remain acceptable in exploratory analyses where loadings above 0.60 can be retained. Overall, Figure 2 provides a visual summary of the measurement structure, demonstrating a generally strong and reliable model.

Table 2. Construct reliability and validity

	Outer Loading	Cronbach's Alpha	CR	AVE
Intellectual Capital				
Human Capital		0.874	0.908	0.665
HC1	0.801			
HC2	0.813			

	Outer Loading	Cronbach's Alpha	CR	AVE
HC3	0.846			
HC4	0.795			
HC5	0.821			
Structural Capital		0.937	0.949	0.726
SC1	0.875			
SC2	0.838			
SC3	0.902			
SC4	0.813			
SC5	0.844			
SC6	0.841			
SC7	0.849			
Relational Capital		0.862	0.900	0.714
RC1	0.784			
RC2	0.817			
RC3	0.808			
RC4	0.783			
RC5	0.810			
Market Sensing Capability				
Customer Sensing Capability		0.937	0.897	0.782
CuSC1	0.860			
CuSC2	0.819			
CuSC3	0.877			
CuSC4	0.792			
CuSC5	0.839			
CuSC6	0.878			
Competitor Sensing Capability		0.944	0.956	0.785
CoSC1	0.881			
CoSC2	0.889			
CoSC3	0.914			
CoSC4	0.852			
CoSC5	0.864			
CoSC6	0.905			
Innovation Capability		0.945	0.956	0.785
IC1	0.884			
IC2	0.874			
IC3	0.914			
IC4	0.899			
IC5	0.870			
IC6	0.873			
Firm's Performance		0.883	0.906	0.519
FP1	0.648			
FP2	0.634			
FP3	0.786			
FP4	0.755			
FP5	0.615			
nFP1	0.701			
nFP2	0.759			
nFP3	0.763			
nFP4	0.756			

As detailed in Table 2, composite reliability values exceed 0.70, Average Variance Extracted surpasses 0.50, and HTMT ratios remain below 0.90, confirming internal consistency, convergent validity, and discriminant validity. Table 2 presents the exact statistical results, further supporting the robustness of the measurement model. Additionally, loadings in the 0.40–0.70 range may be retained when theoretically justified and supported by overall validity assessments.

Table 3. Discriminant validity

	HC (LOC)	SC (LOC)	RC (LOC)	CuSC (LOC)	CoSC (LOC)	IC	FP
HC (LOC)							
SC (LOC)	0.422 (0.297–0.548)						
RC (LOC)	0.757 (0.688–0.831)	0.462 (0.334–0.582)					
CuSC (LOC)	0.562 (0.444–0.679)	0.588 (0.473–0.696)	0.686 (0.571–0.795)				
CoSC (LOC)	0.648 (0.557–0.734)	0.391 (0.269–0.509)	0.614 (0.518–0.703)	0.486 (0.362–0.602)			
IC	0.695 (0.612–0.773)	0.653 (0.544–0.758)	0.730 (0.646–0.805)	0.709 (0.610–0.802)	0.710 (0.619–0.795)		
FP	0.720 (0.634–0.808)	0.731 (0.633–0.823)	0.758 (0.676–0.838)	0.754 (0.653–0.852)	0.742 (0.647–0.830)	**0.926** (0.891–0.959)	

Discriminant validity was assessed using the HTMT criterion with bootstrap inference. As reported in Table 3, all construct pairs exhibit HTMT values below 0.90, except Innovation Capability–Firm Performance (HTMT = 0.926); however, its bootstrap confidence interval does not include 1.00, indicating that discriminant validity is achieved.

4.3. Second Stage in Disjoint Two-Stage Approach Outer Model (LV Score-Higher Order Construct (HOC)

The latent variable scores from the initial stage were used in the subsequent stage to assess variables related to innovation capabilities and business performance. The formative outer model was evaluated to ensure that the indicators accurately represent the intended constructs. Validity and reliability were assessed by comparing statistical significance and estimated weight values.

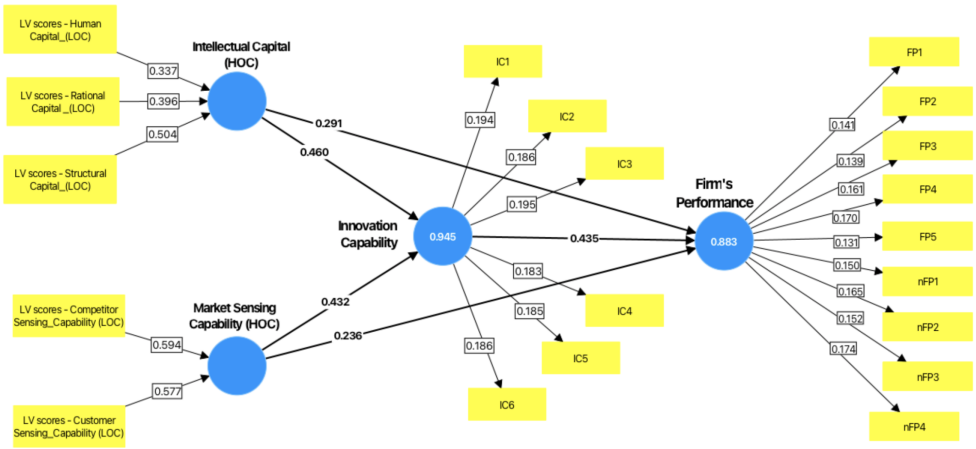

Figure 3. Outer Model Higher Order Component

As shown in Figure 3, indicator relevance for the formative construct was assessed using outer weights and t-statistics. In a formative model, each indicator contributes to the construct, with larger outer weights indicating a stronger influence. The figure provides a visual representation of how each indicator contributes to its respective construct.

Table 4. Indicator Relevance

Indicator → HOC	Weight	p-value	Result
HC (LOC) → Intellectual Capital (HOC)	0.338	0.000	Sig.
SC (LOC) → Intellectual Capital (HOC)	0.504	0.000	Sig.
RC (LOC) → Intellectual Capital (HOC)	0.395	0.000	Sig.
CuSC (LOC) → MSC (HOC)	0.577	0.000	Sig.
CoSC (LOC) → MSC (HOC)	0.594	0.000	Sig.

As detailed in Table 4, the SmartPLS 4 results indicate that all indicators have significant outer weights ($p < 0.05$), confirming that each indicator meaningfully shapes its target construct. The numerical evidence further supports the statistical significance of the formative relationships.

Table 5. Variance Inflation Factor (VIF) Values

Indicator → HOC	**VIF**
HC (LOC) → Intellectual Capital (HOC)	1.827
SC (LOC) → Intellectual Capital (HOC)	1.245
RC (LOC) → Intellectual Capital (HOC)	1.899
CuSC (LOC) → MSC (HOC)	1.264
CoSC (LOC) → MSC (HOC)	1.264

Interactions between indicators and constructs in the formative model are favorable, as all VIF values remain below Table 5. This signifies the absence of substantial multicollinearity concerns among the indicators, indicating their independence and lack of overlap in constructing the overall framework. Consequently, the model is deemed legitimate due to the lack of significant correlations across indicators, thereby reinforcing the stability and precision of the model's estimations.

4.4. Inner Model Higher Order Construct (HOC)

A higher-order construct (HOC) is formed from multiple lower-order constructs (LOCs). The inner-model assessment evaluates how the HOC interacts with other constructs, while the measurement model ensures it is validly and reliably represented by its indicators. As shown in Table 6, model quality is assessed using R^2 (explanatory power), f^2 (effect size), and Q^2predict (predictive relevance). Adequate R^2, meaningful f^2, and positive Q^2predict values indicate that the model has strong explanatory and predictive capability.

Table 6. R-Square values

Variable	**R-Squared**	**R-Squared Adjusted**	**Interpretation**
Innovation Capability	0.701	0.696	Strong
Firm's Performance	0.794	0.789	Very Strong

The R-Squared value, as shown in Table 6, indicates how well the model explains variation in lower-order constructs. For Innovation Capability, the R-Squared value is 0.701 (Adjusted R-Squared = 0.696), meaning nearly 70% of its variance is explained by other variables in the model. For Firm Performance, the R-Squared value is 0.794 (Adjusted R-Squared = 0.789), indicating that about 78% of its variance is explained, suggesting the model effectively captures the variability in firm performance.

Table 7. f-squared values

Path	*f-squared*	*Interpretation*
Intellectual Capital (HOC) → Innovation Capability	0.299	*medium effect*
Intellectual Capital (HOC) → Firm's Performance	0.135	*small effect*
MSC (HOC) → Innovation Capability	0.264	*medium effect*
MSC (HOC) → Firm's Performance	0.091	*small effect*
Innovation Capability → Firm's Performance	0.275	*medium effect*

As shown in Table 7, the f-squared values indicate the impact of higher-order constructs on lower-order constructs or dependent variables. Intellectual Capital (HOC) has a significant influence on Innovation Capability (f-squared = 0.299), enhancing a company's innovation capacity. The relationship between Intellectual Capital (HOC) and Firm Performance shows a minor to moderate effect (f-squared = 0.135), indicating its impact is less substantial than that of innovation capabilities. MSC (HOC) strongly influences Innovation Capability (f-squared = 0.264), while its direct impact on Firm Performance is minor (f-squared = 0.091), suggesting limited influence on performance.

Table 8. Q-Squared values

Variable	**Q-Squared**	**Q-Squared Predict**	**Interpretation**
Innovation Capability	0.545	0.671	*large predictive relevance*
Firm's Performance	0.403	0.711	*large predictive relevance*

As shown in Table 8, the Q-Squared and Q-Squared Predict results indicate strong predictive ability for both constructs. For Innovation Capability, the Q-Squared value of 0.545 suggests the model explains variation well, while the Q-Squared Predict value of 0.671 indicates very strong predictive ability. Similarly, for Firm's Performance, the Q-Squared value of 0.403 shows good explanatory power, with a Q-Squared Predict value

of 0.711, reflecting solid predictive ability, though slightly lower than for Innovation Capability. Overall, both constructs demonstrate excellent predictive ability, with Q-Squared Predict values above 0.5, confirming the model's reliability and relevance for prediction.

Table 9. Hypotheses testing

Hyp.	Path	Std. Coefficient	P Values	CI 5%	CI 95%	Result
H1	Intellectual Capital (HOC) → Innovation Capability	0.460	0.000	0.313	0.607	Supported
H2	MSC (HOC) → Innovation Capability	0.432	0.000	0.272	0.592	Supported
H3	Intellectual Capital (HOC) → Firm's Performance	0.291	0.000	0.166	0.417	Supported
H4	MSC (HOC) → Firm's Performance	0.236	0.002	0.112	0.389	Supported
H5	Innovation Capability → Firm's Performance	0.435	0.000	0.286	0.566	Supported

The bootstrapping results presented in Table 9 provide adequate evidence to support all five hypotheses. All of these hypotheses possess a p-value beneath the designated threshold of 0.05. Furthermore, within the confidence interval (CI) ranging from the lower bound of 5% to the upper bound of 95%, the absence of the value 0 substantiates the significance of the effects, indicating that the coefficients for all five hypotheses exhibit a positive direction.

Table 10. Mediation Hypotheses testing

Hyp.	Path	Std. Coefficient	P Values	Result
H6	Intellectual Capital → Innovation Capability → Firm's Performance	0.200	0.000	Supported
H7	MSC → Innovation Capability → Firm's Performance	0.188	0.000	Supported

As shown in Table 10, all hypotheses show significant mediation effects. Innovation capability partially mediates the relationships between intellectual capital and firm performance, as well as between MSC and firm performance, with both direct and indirect effects remaining significant. This supports the conceptual model, where intellectual capital serves as a foundation and innovation transforms it into sustainable performance. Innovation capability bridges and strengthens, but does not fully replace, the direct effects of intellectual capital and market sensing, making it a key mediator linking organizational capabilities to success.

4.5. Discussion

This study examines the mediating role of innovation capability in the relationships between intellectual capital, MSC, and firm performance. The results show that intellectual capital significantly influences both innovation capability and firm performance. In the fashion industry, intellectual capital embedded in human expertise, structural routines, and relational ties drives new product design, branding, and process improvements. A stronger base of knowledge and routines enhances a firm's ability to experiment, recombine ideas, and scale promising solutions, boosting competitiveness and long-term success. It also provides the flexibility needed to adapt to rapid shifts in trends and platforms.

MSC plays a crucial role in influencing both innovation capability and firm performance. Firms that effectively scan platforms and channels can detect emerging trends earlier, understand shifting customer needs, and anticipate competitor movements. This capability improves the relevance and timing of product launches and marketing efforts, enhancing performance. In the fashion industry, strong market sensing enables firms to align with style cycles, influencer dynamics, and seasonal demand, maintaining a competitive edge.

Innovation capability directly impacts firm performance by enabling the creation of new products, services, and processes that meet evolving customer expectations, differentiate brands, and improve operational efficiency. It allows faster iteration, better product-market fit, and timely responses to market changes, driving profitability, growth, and sustainability. In the fast-moving fashion sector, innovation capability is essential for adapting to shifting preferences and shortening design-to-launch cycles.

Moreover, innovation capability significantly mediates the relationships between intellectual capital and firm performance, and between MSC and firm performance. As a key intermediary, innovation capability

converts intellectual capital and market insights into tangible offerings and process improvements that resonate with consumers. Firms with strong innovation capabilities not only react to market shifts but also anticipate them, allowing proactive adaptation and sustained advantage. In the fashion sector, innovation capability connects intellectual capital and market sensing to superior outcomes, reinforcing their direct effects and ensuring long-term competitiveness.

5. MANAGERIAL IMPLICATIONS

These findings highlight the importance of investing in intellectual capital and market sensing capabilities for fashion companies, particularly in Indonesia's online market. Fashion brands must prioritize developing human capital through skills and knowledge, optimizing organizational structures to enhance structural capital, and strengthening relationships with stakeholders to improve relational capital. These efforts are key to enhancing innovation capabilities. To stay ahead of market trends and consumer expectations, companies must also establish strong market sensing skills. Innovation capability should be viewed not only as a tool for product development but also as a mediator between intellectual capital and market insights to drive business performance. Maintaining a competitive edge and ensuring sustainable growth requires fostering a culture of continuous innovation and responsiveness to market signals. Additionally, our findings suggest that governments and industry leaders should focus on initiatives that promote the development of intellectual capital and market sensing, as these are crucial for boosting the fashion sector's competitiveness.

6. CONCLUSION

The purpose of this study was to examine the roles of intellectual capital, MSC, and innovation capability in influencing firm performance within the Indonesian fashion industry. The results demonstrate that both intellectual capital and MSC significantly impact firm performance, with innovation capability acting as a mediator. Intellectual capital is crucial for fostering innovation and enhancing competitiveness, as it enables firms to leverage human expertise, structural routines, and relational ties. MSC, on the other hand, is vital for understanding consumer preferences and adapting to market dynamics, which directly influences innovation and overall performance. This study presents a conceptual model that illustrates how these factors interact and contribute to the success of businesses in the constantly evolving fashion industry, providing valuable insights into the strategic resources that fashion firms can use to achieve sustainable growth.

This research contributes to the existing body of literature by offering empirical evidence on the mediating role of innovation capability in linking intellectual capital and market sensing capability (MSC) to firm performance. It highlights the importance of the Resource-Based View (RBV) and Dynamic Capability Theory, which explain how intangible assets and adaptive capabilities contribute to the development of a competitive advantage in dynamic industries such as fashion. By integrating these theories, the study illustrates how firms can harness their internal resources to continuously innovate and adapt to market changes, ensuring long-term profitability. The research not only extends previous assumptions by demonstrating that innovation capability directly impacts firm performance, but also strengthens the effects of intellectual capital and MSC. Furthermore, this study contributes to the broader agenda of the United Nations Sustainable Development Goals, particularly SDG 8, by emphasizing the role of innovation and strategic capabilities in promoting sustainable economic growth, enhancing competitiveness, and supporting inclusive development in emerging markets.

7. DECLARATIONS

7.1. About Authors

Santa Lusianna Sitorus (SS) https://orcid.org/0009-0006-6567-3515

Asep Hermawan (AH) https://orcid.org/0009-0003-3811-6201

Anton Wachidin Widjaja (AW) https://orcid.org/0000-0003-3343-3040

Margaretha Pink Berlianto (MB) https://orcid.org/0000-0002-1008-4960

7.2. Author Contributions

Conceptualization: SS; Methodology: AH; Software: MB; Validation: AW and SS; Formal Analysis: AH and MB; Investigation: AW; Resources: SS; Data Curation: AW; Writing Original Draft Preparation: MB

and AH; Writing Review and Editing: AH and SS; Visualization: AW; All authors, SS, AH, AW, and MB, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

REFERENCES

[1] R. Andreu, L. Rienda, and L. Ruiz-Fernández, "The role of intellectual capital and women managers in the internationalization–performance relationship: An analysis of spanish hotel firms," *Journal of Business Research*, vol. 194, p. 115378, May 2025.

[2] X. Li, M. Zhang, W. Li, and J. Chen, "Looking for new possibilities in emerging industries: The impact of strategic sensing capability on high-tech startups' product innovation," *Journal of Business Research*, vol. 189, p. 115183, Feb. 2025.

[3] S. Lestari, S. Watini, and D. E. Rose, "Impact of self-efficacy and work discipline on employee performance in sociopreneur initiatives," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 6, no. 2, pp. 270–284, 2024, https://doi.org/10.34306/att.v6i2.403.

[4] Y. Zhang, H. Li, and Z. Yao, "Intellectual capital, digital transformation and firm performance: evidence based on listed companies in the chinese construction industry," *Engineering, Construction and Architectural Management*, vol. 32, no. 4, pp. 2128–2159, Mar. 2025.

[5] B. E. Sibarani, C. Anggreani, B. Artasya, and D. A. P. Harahap, "Unraveling the impact of self-efficacy, computer anxiety, trait anxiety, and cognitive distortions on learning mind your own business: The student perspective," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 6, no. 1, pp. 29–40, 2024, https://doi.org/10.34306/att.v6i1.377.

[6] R. C. Agostineto, T. C. Soares, G. Mazon, and S. V. Soares, "Influence of intellectual capital and individual absorptive capacity on innovation performance," *Revista de Administração da UFSM*, vol. 15, no. 2, pp. 270–289, 2022.

[7] J. Osman Zainal Abidin, "An empirical investigation into the significance of intellectual capital and strategic orientations on innovation capability and firm performance in malaysian information and communications technology (ict) small-to-medium enterprises (smes)." Ph.D. dissertation, RMIT University, 2024.

[8] N. S. Lubis, S. Hanafi, and S. Hidayat, "Enhancing educator performance through edupreneurship in international baccalaureate programs," *Aptisi Transactions on Technopreneurship (ATT)*, vol. 7, no. 2, pp. 343–359, 2025, https://doi.org/10.34306/att.v7i2.565.

[9] R. M. Gunawan and W. Widodo, "Intellectual capital and corporate governance affect organizational performance through competitive advantage: Evidence from indonesia," *Calitatea*, vol. 23, no. 189, pp. 245–252, 2022.

[10] P. D. Nguyen, "The impact of intellectual capital on firm performance: A study of vietnamese firms listed on vietnam stock exchange," *Journal of Competitiveness*, Mar. 2024.

[11] O. Jayanagara and D. S. S. Wuisan, "An overview of concepts, applications, difficulties, unresolved issues in fog computing and machine learning," *International Transactions on Artificial Intelligence*, vol. 1, no. 2, pp. 213–229, 2023.

[12] X. Sun and M. A. Usman, "Drivers of platform ecosystem adoption: does innovation capability translate these drivers into improved firm performance," *Business Process Management Journal*, vol. 31, no. 1, pp. 118–145, Jan. 2025.

[13] M. Nilashi *et al.*, "How can big data and predictive analytics impact the performance and competitive advantage of the food waste and recycling industry?" *Annals of Operations Research*, Mar. 2023.

[14] H. Nurhaeni, A. Delhi, O. P. M. Daeli, S. A. Anjani, and N. A. Yusuf, "Optimizing electrical energy use through ai: An integrated approach for efficiency and sustainability," *International Transactions on Artificial Intelligence*, vol. 2, no. 2, pp. 106–113, 2024.

[15] N. Zhao, J. Hong, and K. H. Lau, "Impact of supply chain digitalization on supply chain resilience and performance: A multi-mediation model," *International Journal of Production Economics*, vol. 259, p. 108817, May 2023.

[16] C. T. Mukaro, A. Deka, and S. Rukani, "The influence of intellectual capital on organizational performance," *Future Business Journal*, vol. 9, no. 1, p. 31, Jul. 2023.

[17] D. P. Lazirkha, J. Hom, and V. Melinda, "Quality analysis of digital business services in improving customer satisfaction," *Startupreneur Business Digital (SABDA Journal)*, vol. 1, no. 2, pp. 156–166, 2022.

[18] L. Anom and A. A. Safii, "Enhancing msme performance through market sensing capability, innovation capability, and iconic ethnic product development," *Jurnal Ilmu Manajemen Advantage*, vol. 6, no. 1, pp. 1–10, Jul. 2022.

[19] S. Arifin, M. R. Roosdhani, and A. Ali, "Market sensing capability and export channel choice: Unveiling their impact on export performance in the indonesian furniture industry," *Journal of Applied Business, Taxation and Economics Research*, vol. 4, no. 4, pp. 606–616, 2025.

[20] J. I. Saputro, L. F. Sa'adah, Y. Syifa, K. D. Ramadhanti, and M. F. Gojali, "Transforming learning experiences with advanced educational technology solutions," *International Transactions on Education Technology (ITEE)*, vol. 3, no. 2, pp. 114–124, 2025.

[21] T. H. Alaskar, "Innovation capabilities as a mediator between business analytics and firm performance," *Sustainability*, vol. 15, no. 6, p. 5522, Mar. 2023.

[22] I. Alkandi and M. A. Helmi, "The impact of strategic agility on organizational performance: the mediating role of market orientation and innovation capabilities in emerging industrial sector," *Cogent Business & Management*, vol. 11, no. 1, p. 2396528, 2024.

[23] M. Ajeng, A. Kirei, and K. Amanda, "Blockchain technology application for information system security in education," *Blockchain Frontier Technology*, vol. 3, no. 1, pp. 26–31, 2023.

[24] M. M. Migdadi, "Knowledge management processes, innovation capability and organizational performance," *International Journal of Productivity and Performance Management*, vol. 71, no. 1, pp. 182–210, Jan. 2022.

[25] L. N. Phuong, K. C. Tuan, N. N. Duc, and U. N. Thi, "The impact of absorption capability, innovation capability, and branding capability on firm performance—an empirical study on vietnamese retail firms," *Sustainability*, vol. 14, no. 11, p. 6422, May 2022.

[26] I. Handayani, D. Apriani, M. Mulyati, N. A. Yusuf, and A. R. A. Zahra, "A survey on user experience of blockchain transactions: Security and adaptability issues," *Blockchain Frontier Technology*, vol. 3, no. 1, pp. 80–88, 2023.

[27] Y. Soesetio, D. A. Rudiningtyas, A. A. N. Rakhmad, and R. Wiliandr, "Entrepreneurial orientation, innovation, competitiveness, and performance of ultra-micro and micro enterprises in indonesia," *Global Business & Finance Review*, vol. 29, no. 10, p. 55, 2024.

[28] T. S. T. Taleb, N. Hashim, and N. Zakaria, "Mediating effect of innovation capability between entrepreneurial resources and micro business performance," *The Bottom Line*, vol. 36, no. 1, pp. 77–100, Apr. 2023.

[29] P. Hendriyati, F. Agustin, U. Rahardja, and T. Ramadhan, "Management information systems on integrated student and lecturer data," *Aptisi Transactions on Management (ATM)*, vol. 6, no. 1, pp. 1–9, 2022.

[30] L. O. Appiah, D. Essuman, C. A. Forson, N. Boso, and J. Annan, "Green process innovation and financial performance in small and medium-sized enterprises in a developing country: Role of resource orchestration," *Journal of Business Research*, vol. 189, p. 115210, 2025.

[31] S. Akther and M. S. Rahman, "Artificial intelligence driven marketing analytics capability and sustainability positioning in b2b firms: A review and future research direction," *Paradigm*, vol. 29, no. 2, pp. 123–141, 2025.

[32] R. G. Munthe, Q. Aini, N. Lutfiani, I. Van Persie, and A. Ramadhan, "Transforming scientific publication management in the era of disruption: Smartpls approach in innovation and efficiency analysis," *APTISI Transactions on Management*, vol. 8, no. 2, pp. 123–130, 2024.

[33] N. Zahoor and Y. K. Lew, "Enhancing international marketing capability and export performance of emerging market smes in crises: strategic flexibility and digital technologies," *International Marketing*

Review, vol. 40, no. 5, pp. 1158–1187, 2023.
[34] D. Khoshnaw and G. Karadas, "Transactional leadership and intellectual capital, the mediating role of knowledge sharing: The study of customs employees in sulaymaniyah governorate," *Heliyon*, vol. 10, no. 19, 2024.
[35] H. A. Javed, N. A. Khan, S. Michalk, N. U. Khan, and M. Kamran, "High-performance work system and innovation capabilities: The mediating role of intellectual capital," *Administrative Sciences*, vol. 13, no. 1, p. 23, Jan. 2023.
[36] A. W. Alkhatib and M. Valeri, "Can intellectual capital promote the competitive advantage? service innovation and big data analytics capabilities in a moderated mediation model," *European Journal of Innovation Management*, vol. 27, no. 1, pp. 263–289, 2024.
[37] N. Joshi and A. Aggarwal, "Modelling the impact of intellectual capital on financial performance: a case of indian it companies," *Intellectual Economics*, 2023.
[38] G. Cao and J. Weerawardena, "Strategic use of social media in marketing and financial performance: The b2b sme context," *Industrial Marketing Management*, vol. 111, pp. 41–54, May 2023.
[39] A. O. Hakeem, "Exploring the role of dynamic environments on the firms' innovation performance: Mediating roles of technology and market-sensing capability," *International Journal of Innovation Management*, vol. 27, no. 06, p. 2350025, Aug. 2023.
[40] J. Zhang, Sherani, M. Riaz, U. Zia, S. Ali, and J. Liu, "Digital innovation in software smes: the synergy of digital entrepreneurship opportunities, knowledge generation and market-sensing capabilities via moderated–mediation approach," *Business Process Management Journal*, vol. 31, no. 6, pp. 2094–2125, 2025.
[41] M. Mulyana, T. Nurhayati, and E. R. P. Putri, "Improvement of marketing performance: Role of market sensing, digital marketing, and value creation ambidexterity," *Contaduría y Administración*, vol. 69, no. 2, p. 447, Oct. 2023.
[42] Z. Z. Noor, "Application of digital marketing in the capital market based on the theories of consumer behavior and technology adoption," *Economic Annals-XXI*, vol. 207, no. 1–2, pp. 29–33, Feb. 2024.
[43] A. Amroni, A. A. Darmawan, and G. A. Pangilinan, "The role of big data and blockchain in enabling transparent and sustainable business processes," *ADI Journal on Recent Innovation*, vol. 6, no. 2, pp. 180–189, 2025.
[44] P. Somwethee, S. Aujirapongpan, and J. Ru-Zhue, "The influence of entrepreneurial capability and innovation capability on sustainable organization performance: Evidence of community enterprise in thailand," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 9, no. 2, p. 100082, 2023.
[45] S. Purnama, B. L. Pradana, G. Khanna, S. Suhandi, A. Rizky, I. N. Hikam, and M. F. Kamil, "The impact of war on the cryptocurrency economy from a management perspective," *International Journal of Cyber and IT Service Management*, vol. 4, no. 2, pp. 143–154, 2024.
[46] J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, *A primer on partial least squares structural equation modeling (PLS-SEM)*, third edition ed. Thousand Oaks: SAGE Publications, Incorporated, 2022.
[47] F. Zidan, D. Nugroho, and B. A. Putra, "Securing enterprises: Harnessing blockchain technology against cybercrime threats," *International Journal of Cyber and IT Service Management*, vol. 3, no. 2, pp. 168–173, 2023.
[48] A. F. Annur, S. Wartini, S. Martono, and E. Soliha, "The role of innovation capability in the relationship between social capital, entrepreneurial leadership and msme performance in semarang's culinary sector," *Management Analysis Journal*, vol. 14, no. 2, pp. 150–159, 2025.
[49] J. Jones, E. Harris, Y. Febriansah, A. Adiwijaya, and I. N. Hikam, "Ai for sustainable development: Applications in natural resource management, agriculture, and waste management," *International Transactions on Artificial Intelligence*, vol. 2, no. 2, pp. 143–149, 2024.
[50] A. Canbul and M. Cemberci, "Innovation capability as key to competitive advantage: Relation of product innovation capability, process innovation capability, and firm performance," *Journal of International Trade, Logistics and Law*, vol. 9, no. 1, pp. 134–142, Jun. 2023.