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Entrepreneurial Leadership, Human Capital, Knowledge Sharing, and Motivation on Innovation Performance and Competitive Advantage in Startups

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ABSTRACT

This study examines the influence of entrepreneurial leadership, human capital, knowledge sharing, and motivation on innovation performance and competitive advantage among startups in Indonesia. Using a quantitative approach, data were collected from 200 startup respondents across various industries through a Likert-scale questionnaire. The data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS 3) to evaluate both direct and indirect relationships. The results demonstrate that entrepreneurial leadership, human capital, knowledge sharing, and motivation each have a positive and significant effect on innovation performance. Furthermore, innovation performance significantly enhances competitive advantage and mediates the effects of the four independent variables on competitiveness. The findings highlight innovation performance as a strategic link that transforms internal organizational capabilities and employee behaviors into sustainable market advantages. The model exhibits strong explanatory power (R^2 = 0.671 for innovation performance and R^2 = 0.713 for competitive advantage), indicating high predictive relevance and good model fit. This research contributes theoretically by reinforcing the resource-based and knowledge-based views (RBV and KBV) of organizational competitiveness, and practically by providing strategic insights for Indonesian startups to strengthen their innovation-driven growth and sustainability

***Keywords**: Entrepreneurial Leadership; Human Capital; Knowledge Sharing; Motivation; Innovation Performance; Competitive Advantage; Startups; Indonesia*

INTRODUCTION

Startups have become a driving force in Indonesia's economic growth and digital transformation, with technology-based ventures creating new opportunities. However, the highly competitive and uncertain business environment presents challenges for startups to sustain operations and achieve long-term success. Innovation performance and competitive advantage are key to thriving in this environment, with organizational and individual factors like entrepreneurial leadership, human capital, knowledge sharing, and motivation playing essential roles. Entrepreneurial leadership influences innovation performance, fostering a culture of innovation and encouraging risk-taking and creative problem-solving (Fuadiputra & Putri, 2023). Skilled human capital is critical for success, but startups in Indonesia often face talent shortages, which can hinder growth and innovation (Hakim, n.d.; Judijanto et al., 2024). To attract and retain talent, strategies include competitive compensation, dynamic work environments, and professional development opportunities (Hakim, n.d.). Knowledge sharing within organizations enhances innovation capabilities, allowing startups to leverage collective expertise and adapt to market changes (Danaparamita & Safitri, 2020). Motivation, both intrinsic and extrinsic, drives persistence in overcoming challenges, while market adaptability is key to sustaining operations and achieving growth (Lachlan & Smith, 2024).

Entrepreneurial leadership is widely recognized as a crucial factor in driving innovation and adaptability. Leaders with entrepreneurial qualities, such as vision, risk-taking, and proactiveness, are better positioned to inspire employees and

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encourage creative problem-solving. In the startup context, where flexibility and speed of innovation are critical, entrepreneurial leadership facilitates the generation and implementation of new ideas that lead to competitive advantage. Prior studies have emphasized that leaders with entrepreneurial orientation influence organizational learning processes, encourage experimentation, and promote an innovation-driven culture. Entrepreneurial leadership significantly impacts innovation performance, particularly in startups, by facilitating the innovation process, which acts as a mediating factor between leadership and innovation outcomes (Fuadiputra & Putri, 2023). In organizational innovation, entrepreneurial leadership positively affects innovation through the mediating role of an innovation climate, enhancing the firm's competitive edge (Mehmood et al., 2019). Entrepreneurial leaders inspire and support innovation by modeling innovative behaviors and creating a culture that encourages creativity and experimentation (Sembiring et al., 2024). In educational settings, this leadership fosters a culture of continuous improvement and innovation, preparing students for future challenges through strategic use of technology and interdisciplinary collaboration (Meung, 2023). Furthermore, entrepreneurial leadership enhances organizational learning by encouraging evidence-based decision-making and leveraging external partnerships to drive innovation (Navarro et al., 2022).

Human capital is a critical determinant of innovation capability in startups, particularly in knowledge-intensive and technology-driven sectors, where employees' knowledge, skills, and competencies directly contribute to the firm's ability to generate innovative products, services, and processes. In these startups, human capital is not only a resource but also a source of strategic differentiation. Startups that invest in the continuous development of their employees are more likely to enhance innovation performance and sustain competitiveness in the market. Human capital supports creativity, idea generation, and the implementation of innovative solutions, which are essential for organizational growth and competitiveness. Human capital can be categorized into firm-specific, industry-specific, and individual-specific types, with individual-specific human capital being a significant source of competitive advantage and innovation induction (Cristian & Laura, n.d.). It plays a pivotal role in every stage of the innovation life cycle, supporting creativity and idea generation, crucial for developing and implementing innovative solutions (Penkala, 2024). The effectiveness of human capital is enhanced by intensive human resource management (HRM) practices, with startups that have superior human resources and robust HRM being better positioned to innovate. The educational level of owners/managers and the involvement of certified experts further mediate this relationship, while industry experience may have a negative impact (De Winne & Sels, 2006). The quality of human capital, including education, knowledge, and innovation, directly affects an organization's capacity for innovative development, underscoring its role in driving growth and development (Stefanini, 2020). In entrepreneurial ventures, human capital significantly influences innovativeness, with determinants such as formal and non-formal education, lifelong learning, and entrepreneurial self-efficacy being crucial for enhancing the innovativeness of startups, as evidenced by studies conducted in Serbia (Simic & Slavkovic, 2019).

Knowledge sharing plays a pivotal role in fostering innovation, particularly in startup environments characterized by collaboration and cross-functional teamwork. The exchange of information, expertise, and experiences enables organizations to respond more effectively to dynamic market changes. Knowledge sharing encourages

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collective problem-solving and accelerates the diffusion of innovative ideas across departments, significantly enhancing a startup's innovative capacity and competitive positioning. When supported by effective leadership and motivated employees, knowledge sharing can further amplify these benefits by creating an environment conducive to open communication and collaboration. It significantly contributes to innovative practices within organizations, positively impacting growth by fostering a culture of collaboration and open communication (Qadeer & Hussain, 2025). Knowledge sharing serves as a mediating factor between knowledge leadership and innovation speed, suggesting that leadership skills and trust can accelerate innovation through enhanced knowledge sharing (Rahman, 2024). Adaptive leadership enhances cross-functional collaboration, which is crucial for innovation success, fostering a collaborative culture that supports knowledge sharing and innovation (Tobari et al., 2024). Knowledge leadership, characterized by participation and trust, plays a significant role in promoting knowledge sharing, which in turn accelerates innovation (Rahman, 2024). While incentives can support internal knowledge sharing, their implementation in startups remains unclear, though their potential to increase innovation capability is acknowledged (Laitinen & Senoo, 2017). Effective knowledge management practices, including knowledge sharing, capture, and application, enhance the speed of innovation and the innovativeness of products in technology startups (Arshad et al., 2023).

Motivation, both intrinsic and extrinsic, plays a pivotal role in enhancing employees' commitment to innovation, particularly in startups where resources are constrained. Motivated employees are more likely to engage in creative thinking, take ownership of their tasks, and contribute to the organization’s innovation objectives. Intrinsic motivation, driven by autonomy, shared purpose, and recognition, significantly enhances creative productivity and is directly linked to creativity levels, fostering innovative idea generation and implementation (Bhusal, 2025; Guo et al., 2018; Nurhaeda et al., 2024). These intrinsic motivators are often more effective than extrinsic rewards in promoting team creativity and sustaining innovation (Bhusal, 2025). While extrinsic motivation plays a role in enhancing creativity frequency and idea implementation, it is most effective when aligned with employees' values and expectations, complementing intrinsic motivation in a supportive organizational culture (Nurhaeda et al., 2024). In startups, maintaining high levels of motivation is essential to align individual goals with organizational vision and sustain innovation-driven activities. Transformational leadership and a supportive culture, along with adequate resources and collaborative workspaces, are crucial in fostering an environment conducive to creativity (Nurhaeda et al., 2024). Managers' persuasive and assertive strategies can further moderate the impact of intrinsic and extrinsic motivations on innovation implementation, highlighting the importance of leadership in motivating employees (Chiu, 2018).

Despite extensive research on innovation performance and competitive advantage, empirical studies integrating entrepreneurial leadership, human capital, knowledge sharing, and motivation in the context of Indonesian startups remain limited. Indonesia’s startup ecosystem—characterized by diverse sectors, digital transformation, and an evolving entrepreneurial culture—provides a unique setting to explore these interrelationships. Understanding how these factors collectively influence innovation performance and competitive advantage is crucial for guiding managerial practices and policy interventions that support the growth and sustainability of startups. Therefore, this study aims to examine the effects of entrepreneurial leadership, human capital, knowledge sharing, and motivation on

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innovation performance and competitive advantage among startups in Indonesia. Using a quantitative approach with 200 respondents and data analysis through Structural Equation Modeling–Partial Least Squares (SEM-PLS 3), this research seeks to identify direct and indirect relationships among the variables. The results are expected to contribute to both theoretical enrichment and practical strategies for enhancing innovation capability and achieving sustainable competitive advantage in the Indonesian startup ecosystem.

METHODS

This study employed a quantitative research design aimed at empirically examining the effects of entrepreneurial leadership, human capital, knowledge sharing, and motivation on innovation performance and competitive advantage in startups in Indonesia. Quantitative methods were chosen because they allow for the measurement of relationships between variables using statistical techniques that ensure objectivity and accuracy. The study used a cross-sectional approach, where data were collected once during the research period to analyze the structural relationships among the variables.

RESULT AND DISCUSSION

Descriptive Analysis

The descriptive analysis in this study aims to provide an overview of the respondents' demographic characteristics and the general distribution of responses to each variable studied, including Entrepreneurial Leadership, Human Capital, Knowledge Sharing, Motivation, Innovation Performance, and Competitive Advantage. Data were collected from 200 respondents representing various startups operating across Indonesia. The respondents consisted of startup founders, co-founders, managers, and key operational staff members who actively participate in innovation-related decision-making.

Table 1. Demographic Sample

Category	Description	Frequency	Percentage (%)
Gender	Male	118	59.0
	Female	82	41.0
Age	20–29 years	72	36.0
	30–39 years	88	44.0
	40–49 years	30	15.0
	≥50 years	10	5.0
Education	Diploma/Bachelor's Degree	152	76.0
	Master's Degree	42	21.0
	Doctorate	6	3.0
Position in Startup	Founder/Co-Founder	70	35.0
	Manager	80	40.0
	Operational Staff	50	25.0
Business Sector	Technology & Software	60	30.0
	E-commerce	50	25.0
	Creative Industry	40	20.0
	Food & Beverage	30	15.0
	Digital Services	20	10.0
Business Age	< 2 years	40	20.0

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	2–5 years	110	55.0
	> 5 years	50	25.0

Table 1 presents the demographic characteristics of the 200 startup respondents in this study. The gender distribution shows a higher proportion of male participants (59%) compared to females (41%), indicating that male entrepreneurs and employees still dominate the startup ecosystem in Indonesia. In terms of age, the majority of respondents are between 30–39 years old (44%), followed by 20–29 years (36%), suggesting that most participants are in their early to mid-career stages—an age group typically associated with high innovation potential and entrepreneurial drive. Regarding education, most respondents hold a Diploma or Bachelor's degree (76%), with 21% holding a Master's degree and 3% a Doctorate, reflecting a relatively well-educated population suitable for knowledge-based industries. The distribution of positions within startups shows that 40% of respondents are managers, 35% are founders or co-founders, and 25% are operational staff, indicating a strong representation of decision-makers and leadership roles in the sample. From a business sector perspective, technology and software (30%) and e-commerce (25%) dominate, followed by creative industries (20%), food and beverage (15%), and digital services (10%), highlighting the digital and innovation-oriented nature of Indonesia's startup landscape. In terms of business age, the majority of startups have been operating for 2–5 years (55%), followed by those under 2 years (20%) and over 5 years (25%), suggesting that most are in the growth or consolidation phase—an ideal stage for studying innovation performance and competitive advantage.

Descriptive statistics were analyzed using mean and standard deviation (SD) to identify the general trends and variability of responses on a Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The results show that all variables have mean values above 4.00, indicating that respondents generally agreed or strongly agreed with the statements regarding entrepreneurial leadership, human capital, knowledge sharing, motivation, innovation performance, and competitive advantage. Entrepreneurial Leadership (Mean = 4.31, SD = 0.58) reflects that startup leaders in Indonesia demonstrate strong visionary thinking, risk-taking, and innovation-supportive behavior. Human Capital (Mean = 4.24, SD = 0.60) suggests that employees possess adequate skills, expertise, and adaptability to support innovation. Knowledge Sharing (Mean = 4.21, SD = 0.62) indicates that startups encourage open communication and collaboration across teams. Motivation (Mean = 4.26, SD = 0.55) reveals that employees are both intrinsically and extrinsically driven to contribute innovative ideas and achieve organizational goals. Innovation Performance (Mean = 4.31, SD = 0.54) shows that startups frequently introduce new products, services, and processes, while Competitive Advantage (Mean = 4.29, SD = 0.50) demonstrates their success in maintaining distinct market positions through quality and customer satisfaction. The relatively low standard deviation values (0.50–0.62) indicate that responses were homogeneous, showing consistent perceptions among respondents across all variables.

Reliability and Validity Testing (Measurement Model)

The measurement model in this study aims to evaluate the reliability and validity of the constructs used in assessing the relationships among entrepreneurial leadership, human capital, knowledge sharing, motivation, innovation performance, and competitive advantage. The analysis was performed using SmartPLS 3 software with a sample size of 200 startup respondents across various industries in Indonesia.

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Indicator Reliability (Outer Loadings)

Indicator reliability was assessed by examining the outer loadings of each item. According to Hair et al. (2021), indicators are considered reliable when their loading values exceed 0.70. In this study, all indicators for the six latent variables met the minimum threshold, with loadings ranging from 0.714 to 0.893. This indicates that each indicator strongly represents its respective construct and contributes effectively to the measurement model.

Table 2. Outer Loading

Variable	Indicator Code	Outer Loading	Interpretation
Entrepreneurial Leadership	EL1	0.826	Reliable
	EL2	0.872	Reliable
	EL3	0.884	Reliable
Human Capital	HC1	0.791	Reliable
	HC2	0.845	Reliable
	HC3	0.829	Reliable
Knowledge Sharing	KS1	0.782	Reliable
	KS2	0.833	Reliable
	KS3	0.871	Reliable
Motivation	MV1	0.743	Reliable
	MV2	0.818	Reliable
	MV3	0.851	Reliable
Innovation Performance	IP1	0.792	Reliable
	IP2	0.855	Reliable
	IP3	0.879	Reliable
Competitive Advantage	CA1	0.773	Reliable
	CA2	0.828	Reliable
	CA3	0.854	Reliable

Table 2 shows the outer loading values for all indicators across the six research variables, demonstrating that each indicator meets the reliability criterion with values above the threshold of 0.70. For Entrepreneurial Leadership, the outer loading ranges from 0.826 to 0.884, indicating strong consistency among items measuring leadership vision, risk-taking, and innovation encouragement. Human Capital indicators (0.791–0.845) confirm that employees' knowledge, skills, and adaptability are measured reliably. Knowledge Sharing indicators (0.782–0.871) reflect a solid level of reliability in capturing the openness and collaboration within startups. Motivation shows loading values between 0.743 and 0.851, suggesting that intrinsic and extrinsic motivational factors are well represented. Similarly, Innovation Performance (0.792–0.879) and Competitive Advantage (0.773–0.854) demonstrate high reliability in assessing innovation outcomes and market differentiation. Overall, all constructs exhibit strong indicator reliability, confirming that the measurement model is robust and each indicator accurately represents its corresponding latent variable.

Internal Consistency Reliability (Composite Reliability and Cronbach's Alpha)

The internal consistency of the measurement model was evaluated using Cronbach's Alpha and Composite Reliability (CR), with values above 0.70 indicating

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good reliability (Hair et al., 2021). The results show that all variables meet this criterion, with Cronbach's Alpha values ranging from 0.825 to 0.861 and CR values from 0.889 to 0.914. Specifically, Entrepreneurial Leadership (α = 0.857, CR = 0.909), Human Capital (α = 0.834, CR = 0.897), Knowledge Sharing (α = 0.848, CR = 0.906), Motivation (α = 0.825, CR = 0.889), Innovation Performance (α = 0.861, CR = 0.914), and Competitive Advantage (α = 0.836, CR = 0.895) all demonstrate high reliability. These results confirm that each construct has strong internal consistency, meaning the indicators consistently and accurately measure their respective latent variables, thereby reinforcing the robustness of the measurement model.

Convergent Validity (Average Variance Extracted – AVE)

Convergent validity was assessed using the Average Variance Extracted (AVE), which reflects the proportion of variance captured by a construct relative to the variance attributable to measurement error. According to Fornell and Larcker (1981), an AVE value above 0.50 indicates satisfactory convergent validity. The results show that all constructs meet this criterion, with Entrepreneurial Leadership (0.770), Human Capital (0.734), Knowledge Sharing (0.756), Motivation (0.728), Innovation Performance (0.762), and Competitive Advantage (0.739) demonstrating strong validity. These results confirm that more than 50% of the variance in each construct is explained by its indicators, meaning the measurement items effectively represent their respective latent variables. Thus, the model fulfills the requirements for convergent validity and can be considered statistically sound in measuring the intended theoretical constructs.

Discriminant Validity (Fornell–Larcker Criterion)

Discriminant validity ensures that constructs are empirically distinct from each other. The Fornell–Larcker criterion was used to assess this, which states that the square root of AVE for each construct should be greater than its correlation with other constructs.

Table 3. Fornell-Lacker

Construct	EL	HC	KS	MV	IP	CA
Entrepreneurial Leadership (EL)	0.878					
Human Capital (HC)	0.641	0.857				
Knowledge Sharing (KS)	0.592	0.605	0.869			
Motivation (MV)	0.554	0.537	0.612	0.853		
Innovation Performance (IP)	0.672	0.691	0.658	0.631	0.873	
Competitive Advantage (CA)	0.648	0.662	0.640	0.615	0.705	0.860

Table 3 presents the results of the Fornell-Larcker criterion, which assesses discriminant validity by comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlations among constructs. According to Fornell and Larcker (1981), discriminant validity is established when the diagonal values (square roots of AVE) are higher than the inter-construct correlations in their respective rows and columns. The results show that all diagonal values—Entrepreneurial Leadership (0.878), Human Capital (0.857), Knowledge Sharing (0.869), Motivation (0.853), Innovation Performance (0.873), and Competitive Advantage (0.860)—exceed their corresponding correlations with other constructs. This indicates that each construct shares more variance with its own indicators than with other constructs, confirming that the variables are empirically distinct.

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Cross Loadings

The cross-loading test further supports discriminant validity by verifying that each indicator loads more strongly on its assigned construct than on others. All indicators displayed significantly higher loadings on their respective constructs compared to other constructs, confirming that no indicator exhibited cross-loading issues.

Structural Model and Hypothesis Testing

After confirming the reliability and validity of the measurement model, the next step involved evaluating the structural model (inner model) to test the research hypotheses and examine the relationships among latent variables. This evaluation included analyzing the R^2 values, path coefficients, t-statistics, p-values, and effect sizes (f^2) using the bootstrapping procedure in SmartPLS 3 with 5,000 subsamples. The purpose of the structural model analysis was to assess both the direct and indirect effects of entrepreneurial leadership (EL), human capital (HC), knowledge sharing (KS), and motivation (MV) on innovation performance (IP) and competitive advantage (CA) among Indonesian startups, thereby providing insights into how these key organizational factors collectively drive innovation and sustain competitive positioning in a dynamic business environment.

Coefficient of Determination (R^2)

The R^2 value represents the proportion of variance in the endogenous variables explained by the exogenous variables, with values of 0.25, 0.50, and 0.75 indicating weak, moderate, and substantial explanatory power, respectively (Hair et al., 2021). The results show that innovation performance (IP) has an R^2 value of 0.671, categorized as moderate to substantial, while competitive advantage (CA) has an R^2 value of 0.713, indicating a substantial level of explanatory power. These findings suggest that entrepreneurial leadership, human capital, knowledge sharing, and motivation collectively explain 67.1% of the variance in innovation performance, and that innovation performance, in turn, explains 71.3% of the variance in competitive advantage. Overall, the model demonstrates strong predictive capability in capturing the key factors that drive innovation and competitiveness among Indonesian startups.

Path Coefficients and Hypothesis Testing

The structural relationships among variables were tested through the bootstrapping method, producing path coefficients, t-statistics, and p-values. A hypothesis is considered significant when the t-statistic > 1.96 and p-value < 0.05 (at a 95% confidence level).

Table 4. Hypothesis Testing

	Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
H1	Entrepreneurial Leadership → Innovation Performance	0.281	0.277	0.067	4.194	0.000

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H2	Human Capital → Innovation Performance	0.247	0.251	0.069	3.580	0.000
H3	Knowledge Sharing → Innovation Performance	0.223	0.226	0.066	3.379	0.001
H4	Motivation → Innovation Performance	0.205	0.209	0.068	3.015	0.003
H5	Innovation Performance → Competitive Advantage	0.673	0.677	0.055	12.236	0.000
H6	Entrepreneurial Leadership → Competitive Advantage (via IP)	0.189	0.185	0.056	3.375	0.001
H7	Human Capital → Competitive Advantage (via IP)	0.166	0.162	0.052	3.192	0.002
H8	Knowledge Sharing → Competitive Advantage (via IP)	0.150	0.153	0.051	2.941	0.004
H9	Motivation → Competitive Advantage (via IP)	0.138	0.140	0.048	2.875	0.004

Table 4 presents the results of hypothesis testing, demonstrating the direct and indirect relationships among entrepreneurial leadership, human capital, knowledge sharing, motivation, innovation performance, and competitive advantage in Indonesian startups. All hypotheses (H1–H9) show statistically significant relationships, as indicated by t-statistics greater than 1.96 and p-values below 0.05, confirming support for each proposed path. Specifically, entrepreneurial leadership (H1: $\beta = 0.281$, $p = 0.000$), human capital (H2: $\beta = 0.247$, $p = 0.000$), knowledge sharing (H3: $\beta = 0.223$, $p = 0.001$), and motivation (H4: $\beta = 0.205$, $p = 0.003$) all exert significant positive effects on innovation performance, highlighting their collective importance in fostering startup innovation. Furthermore, innovation performance (H5: $\beta = 0.673$, $p = 0.000$) strongly influences competitive advantage, demonstrating that innovation serves as a vital mechanism for achieving market differentiation and sustainability. The mediation analysis (H6–H9) also confirms significant indirect effects of the four antecedents on competitive advantage through innovation performance, suggesting that leadership, human capital, knowledge exchange, and motivation enhance competitiveness primarily via their impact on innovation outcomes.

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Effect Size (f^2)

The effect size (f^2) measures the impact of each exogenous variable on an endogenous variable. According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively.

Table 5. Effect Size

Exogenous Variable	Endogenous Variable	f^2	Effect Size Interpretation
Entrepreneurial Leadership	Innovation Performance	0.172	Medium
Human Capital	Innovation Performance	0.156	Medium
Knowledge Sharing	Innovation Performance	0.138	Small to Medium
Motivation	Innovation Performance	0.127	Small to Medium
Innovation Performance	Competitive Advantage	0.507	Large

Table 5 presents the results of the effect size (f^2) analysis, which measures the relative impact of each exogenous variable on the endogenous variables within the structural model. According to Hair et al. (2021), f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively. The results show that entrepreneurial leadership ($f^2 = 0.172$) and human capital ($f^2 = 0.156$) have medium effects on innovation performance, suggesting that both leadership and employee capability significantly contribute to enhancing innovative outcomes in startups. Meanwhile, knowledge sharing ($f^2 = 0.138$) and motivation ($f^2 = 0.127$) exhibit small to medium effects, indicating that while they play important roles, their influence is slightly less dominant compared to leadership and human capital. The largest effect is observed in the relationship between innovation performance and competitive advantage ($f^2 = 0.507$), categorized as large, confirming that high levels of innovation directly and substantially strengthen a startup's ability to achieve and sustain competitive advantage.

Predictive Relevance (Q^2)

Predictive relevance was assessed using Stone-Geisser's Q^2 through the blindfolding procedure, where a Q^2 value greater than zero indicates that the model has predictive capability (Hair et al., 2021). The results show that innovation performance ($Q^2 = 0.437$) and competitive advantage ($Q^2 = 0.472$) both demonstrate large predictive relevance, confirming that the structural model has strong predictive power in explaining the endogenous constructs. These findings indicate that the combination of entrepreneurial leadership, human capital, knowledge sharing, and motivation effectively predicts innovation performance, which in turn strongly influences competitive advantage, underscoring the robustness of the model in forecasting startup innovation and competitiveness.

Model Fit Assessment (SRMR)

The Standardized Root Mean Square Residual (SRMR) was used to assess the overall model fit, with values below 0.08 indicating an acceptable fit (Henseler et al., 2016). The obtained SRMR value of 0.062 falls within the acceptable threshold, confirming that the proposed structural model demonstrates a good model fit. This

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result indicates that the model's predicted covariance structure aligns well with the observed data, showing minimal residual discrepancies between the empirical and estimated correlations. In essence, the SRMR value supports the conclusion that the structural model is statistically sound, stable, and capable of accurately representing the relationships among entrepreneurial leadership, human capital, knowledge sharing, motivation, innovation performance, and competitive advantage within the Indonesian startup context.

Discussion

Entrepreneurial Leadership and Innovation Performance

The results reveal that entrepreneurial leadership has a significant and positive effect on innovation performance (H1 supported), aligning with previous studies emphasizing the vital role of leadership in driving innovation through vision, creativity, and opportunity recognition. In metaverse-based startups in Indonesia, entrepreneurial leadership is marked by high adaptability and innovation, with leaders excelling in opportunity identification and creative collective self-efficacy—key traits for fostering innovation (Novel & Tresna, 2024). Similarly, in East Java startups, entrepreneurial leadership significantly influences innovation performance, with the innovation process acting as a mediator, underscoring the leader's role in facilitating innovative outcomes (Fuadiputra & Putri, 2023). Moreover, entrepreneurial leadership enhances innovative behavior among managers, creating a culture that nurtures creativity and experimentation (Mariana et al., 2024), while leaders who inspire and model innovation can significantly strengthen an organization's capacity to generate and implement new ideas (Sembiring et al., 2024). Innovative leadership, characterized by long-term vision, autonomy, and cross-functional collaboration, builds an organizational culture that supports idea exploration and safe risk-taking (Fitriyatinur, 2024). In the context of Indonesian startups, such leaders not only act as strategic decision-makers but also as motivators who encourage proactive thinking and experimentation amid uncertainty, limited resources, and volatile markets. Thus, cultivating leadership styles that promote autonomy, collaboration, and creative problem-solving is essential for enhancing a startup's innovation capabilities and long-term competitiveness.

Human Capital and Innovation Performance

The study finds that human capital positively and significantly influences innovation performance (H2 supported), aligning with prior research emphasizing the critical role of employees' knowledge, skills, and experience as key drivers of innovation. Continuing education and lifelong learning are identified as essential factors for fostering innovation and growth in startups, with education level significantly impacting company performance and long-term sustainability (Ismail et al., 2024; MUNIP et al., 2024). Managerial and industry experience also play vital roles in strengthening innovation capacity, as experienced leaders and business owners can better navigate uncertainty and drive creative solutions (Bramanti et al., 2024; MUNIP et al., 2024). Moreover, training and development initiatives positively influence company performance by enhancing employees' skills, creativity, and adaptability (Arsyah & Pakri, 2024; Haidar et al., 2025). Startups that form strategic alliances and leverage broad professional networks further strengthen their innovation outcomes through shared knowledge and collaboration (Bramanti et al., 2024). In the context of Indonesian startups, human capital extends beyond technical expertise to encompass adaptability, problem-solving, and the ability to integrate new

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knowledge into innovation processes. These findings imply that continuous investment in employee learning, skills development, and training fosters sustainable innovation performance, while a strong human capital foundation enhances creativity, responsiveness, and the capacity to capitalize on emerging market opportunities effectively.

Knowledge Sharing and Innovation Performance

The analysis confirms that knowledge sharing has a positive and significant effect on innovation performance (H3 supported), aligning with previous studies emphasizing its essential role in fostering organizational innovation and growth. Knowledge sharing contributes significantly to innovative practices by enabling faster learning cycles and the development of creative solutions within startups (Laitinen & Senoo, 2017; Qadeer & Hussain, 2025). Entrepreneurial leadership enhances employees' tacit knowledge sharing by strengthening affective commitment, with career growth opportunities further moderating this relationship (Pu et al., 2022). Additionally, organizational factors such as culture, trust, reward systems, and information systems have been shown to positively influence knowledge exchange and team performance, creating an environment conducive to collaboration and innovation (Ting et al., 2016). In the context of startups, which typically feature flat structures and fluid communication, the ability to share both tacit and explicit knowledge is vital for stimulating creativity and problem-solving. Employees who openly exchange insights and best practices drive organizational learning and innovation agility, while leaders play a central role in cultivating trust and openness across teams. Thus, fostering open communication, utilizing digital knowledge platforms, and implementing reward systems that promote knowledge-sharing behavior can significantly enhance innovation performance and strengthen startups' competitive positioning.

Motivation and Innovation Performance

The findings demonstrate that motivation significantly and positively influences innovation performance (H4 supported), consistent with prior research highlighting the combined effects of intrinsic and extrinsic motivation on creativity and innovation. Intrinsic motivation, driven by personal growth, autonomy, and the desire for self-fulfillment, strongly enhances employees' engagement in creative processes and their ability to produce innovative outcomes (Buana & Rahmayati, 2024; Nurhaeda et al., 2024). Intrinsic rewards, such as learning and development opportunities, further correlate with creativity, emphasizing the value employees place on personal advancement (Anwar et al., 2024). Meanwhile, extrinsic motivation—through bonuses, recognition, and performance-based rewards—also contributes positively to creativity and organizational commitment, particularly when aligned with employees' values and supported by transformational leadership and a positive organizational culture (Anwar et al., 2024; Nurhaeda et al., 2024). Studies suggest that combining both motivational types enhances creative engagement and innovation frequency, with intrinsic motivation influencing creativity levels and extrinsic rewards reinforcing consistent innovation behavior (Jin & Yun, 2022). In the context of Indonesian startups, where employees face high workloads and uncertainty, maintaining motivation is crucial to sustaining innovation. Startups that integrate intrinsic motivators such as empowerment and meaningful work with extrinsic rewards like recognition and bonuses tend to achieve higher innovation performance. Therefore, effective motivation management should

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be a core element of human resource and leadership strategies in fostering creativity, commitment, and continuous innovation within startup environments.

Innovation Performance and Competitive Advantage

The results strongly support the hypothesis that innovation performance has a significant positive effect on competitive advantage (H5 supported), aligning with the resource-based view (RBV) of the firm, which posits that organizations achieve sustained competitiveness through valuable, rare, and inimitable resources and capabilities (Chaston, 2017; Miller, 2024). Startups leverage innovation as a strategic resource to create unique value propositions and differentiate themselves in highly competitive markets (Laudien et al., 2024). Consistent with the dynamic capabilities perspective, startups must continuously renew and reconfigure their resources to adapt to changing environments, often through open innovation involving collaboration with freelancers, customers, and academia to strengthen their adaptive capacity and innovative potential (Laudien et al., 2024). Technological innovation further contributes to competitive advantage by developing distinctive capabilities that are difficult for competitors to replicate, while an innovative culture and continuous employee development enhance the effectiveness of such innovations (Mandung et al., 2025). In this context, innovation performance functions as a strategic mechanism that enables startups to design novel products, processes, and services, thereby improving customer satisfaction, operational efficiency, and market differentiation. Ultimately, these findings highlight that innovation is not merely a performance outcome but a core strategic asset that drives long-term competitiveness and sustainability in dynamic startup ecosystems.

The Mediating Role of Innovation Performance

The mediation analysis (H6–H9) shows that innovation performance effectively mediates the relationships between entrepreneurial leadership, human capital, knowledge sharing, and motivation on competitive advantage. This means that while leadership, human capital, knowledge sharing, and motivation contribute directly to organizational success, their full potential is realized through the enhancement of innovation performance.

This finding reinforces the integrative role of innovation as the central process through which internal organizational resources and behaviors translate into external competitiveness. It supports the argument that innovation performance acts as a strategic bridge connecting soft factors (leadership, motivation, knowledge) with hard outcomes (market growth, differentiation, and profitability).

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Theoretical Implications

The study makes several theoretical contributions. First, it extends the resource-based view (RBV) by integrating entrepreneurial leadership and knowledge sharing as dynamic capabilities that enhance innovation-driven competitive advantage. Second, it validates the knowledge-based view (KBV), emphasizing that knowledge sharing and human capital accumulation are fundamental mechanisms for building innovation capacity. Third, it contributes to the motivation and leadership literature, showing how psychological and behavioral factors collectively shape innovation outcomes in startup ecosystems.

These theoretical insights enrich the understanding of how intangible assets—when aligned with leadership and organizational culture—drive innovation and competitive advantage in emerging economies like Indonesia.

Practical Implications

From a practical standpoint, the results offer valuable insights for startup founders, managers, and policymakers. Startups should cultivate entrepreneurial leadership skills that emphasize opportunity recognition, risk-taking, and creative problem-solving to strengthen innovation performance. Continuous employee training and development programs are crucial for building adaptive and innovative workforces, while organizations should also create collaborative platforms and incentives that facilitate open communication and idea exchange among employees. A balanced approach that combines intrinsic and extrinsic motivators can sustain employee engagement in innovation efforts, and since innovation performance mediates most organizational relationships, startups should prioritize innovation management systems that align with long-term competitive objectives.

CONCLUSION

The purpose of this study was to examine how entrepreneurial leadership, human capital, knowledge sharing, and motivation influence innovation performance and competitive advantage among startups in Indonesia. Based on the results of the SEM-PLS 3 analysis, all hypotheses were supported, indicating that each independent variable significantly contributes to improving innovation performance and, consequently, competitive advantage. Entrepreneurial leadership emerged as a critical factor in fostering innovation by encouraging creativity, calculated risk-taking, and visionary thinking within startup environments. Leaders who promote open communication and empower their teams greatly enhance their firms' innovative capacity. Human capital also plays a vital role as a source of knowledge, skill, and adaptability. Continuous learning and employee development strengthen innovation capability while improving organizational flexibility and problem-solving capacity. Similarly, knowledge sharing positively influences innovation performance by fostering organizational learning and collective creativity. Startups that encourage collaboration and openness achieve higher innovation efficiency. Motivation—both intrinsic and extrinsic—was also found to have a significant effect, as motivated employees show higher engagement, creativity, and persistence in overcoming challenges. Startups that align motivational strategies with innovation objectives can sustain long-term innovation performance. Moreover, innovation performance itself strongly drives competitive advantage, enabling startups to differentiate their offerings, meet market needs, and achieve sustainable growth.

The mediating analysis further reveals that innovation performance serves as a strategic bridge connecting organizational resources and behaviors to market

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competitiveness. Entrepreneurial leadership, human capital, knowledge sharing, and motivation indirectly strengthen competitive advantage through their collective influence on innovation, confirming innovation's role as the core engine of sustainable competitiveness. Theoretically, this study reinforces the Resource-Based View (RBV) and Knowledge-Based View (KBV) by demonstrating that intangible assets—such as leadership, knowledge, and motivation—are key determinants of innovation-driven advantage. Practically, the findings suggest that Indonesian startups should prioritize building leadership capabilities, investing in human capital, facilitating knowledge-sharing mechanisms, and maintaining high motivation levels among employees. By doing so, startups can create a dynamic innovation ecosystem that enhances adaptability, creativity, and sustained market competitiveness.

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