



Human Capital and SME Internationalization: The Mediating Role of Digital Capability in Teak Wood Craft SMEs

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Abstract

Background and Aims: Despite growing interest in SME internationalization, limited attention has been paid to the mediating mechanisms that convert human capital into global outcomes, particularly in traditional manufacturing sectors. This study examines human capital's role in the internationalization of MSMEs in the teak craft sector, investigating its direct impact on international outcomes and the mediating role of digital capability in transforming resources into global competitiveness.

Study Design: This research employs a quantitative explanatory survey design to test the structural relationships among human capital, digital capability, and internationalization.

Place and Duration of Study: The study was conducted in Bojonegoro Regency, East Java, Indonesia, an area recognized for its local resource endowments and teak woodcraft production. Data collection was carried out over several months.

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Methodology: Data were collected from 150 owners or managers of teak woodcraft MSMEs using a five-point Likert scale. The constructs were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate measurement validity and reliability, and to test direct and mediating effects.

Results: Human capital exerts a strong, positive, and significant effect on digital capability, which in turn significantly influences internationalization. While human capital also directly affects internationalization, its direct effect is smaller than the indirect pathway. Crucially, digital capability serves as a significant partial mediator in the relationship between human capital and internationalization.

Conclusion: Human capital alone is insufficient for optimal international success; firms must strategically develop digital capability. Theoretically, this study extends the Resource-Based View by positioning digital capability as a dynamic conversion mechanism that operationalizes human capital into international competitiveness. Practically, these findings guide policymakers and SME practitioners in designing targeted digital training programs. Socially, enhancing digital skills among artisans supports cultural heritage preservation while fostering sustainable economic empowerment.

Keywords: *Bojonegoro; digital capability; human capital; internationalization; MSMEs; PLS-SEM; teak woodcraft.*

1. Introduction

In today's global economy, internationalization is a strategic necessity for firm survival and growth. However, many organizations struggle to sustain their global presence due to a combination of external barriers and internal constraints. Externally, institutional differences, socio-cultural gaps, and economic fluctuations create significant hurdles for cross-border expansion (Alkhalailah et al., 2024). Internally, limited access to strategic resources, inadequate market knowledge, and shortages of internationally skilled personnel further hinder firms' ability to capitalize on global opportunities (Rezaei et al., 2021). These challenges underscore that successful internationalization depends not merely on external market conditions, but fundamentally on how firms deploy and adapt their internal resources amid uncertainty.

Within this context, human capital is widely recognized as a critical driver of global expansion. Prior research indicates that industry-specific knowledge, managerial experience, and workforce skills enhance firms' readiness to enter foreign markets and improve export performance (Sualeh Khattak et al., 2026). However, empirical findings remain inconsistent. Some studies suggest that human capital does not always translate into significant internationalization outcomes (Pinkwart & Proksch, 2014, London, 2010), and in certain cases, formal education may even lead to suboptimal strategic decisions when misaligned with market demands (Gashi, 2014). These inconsistencies highlight a critical theoretical gap: while human capital is necessary, it alone is insufficient for successful global expansion without an effective conversion mechanism.

This limitation points to a more profound concern. Current discourse often assumes that human capital inherently generates value, yet pays insufficient attention to the processes that transform this potential into concrete strategic capabilities. Without a dynamic mechanism to operationalize internal resources, human capital risks remaining underutilized and unable to yield tangible competitive advantages (Melén & Nordman, 2007). In the era of digital transformation, digital capability emerges as a vital mechanism that bridges this gap. Digital capability reflects a firm's capacity to integrate, deploy, and leverage digital technologies to support strategic objectives. Its development is fundamentally rooted in the quality of human capital, particularly technical expertise, managerial agility, and adaptability to technological change (Korshunova, 2020). Firms equipped with strong human capital are better positioned to build digital infrastructures and business models that enhance flexibility and responsiveness in dynamic environments.

Moreover, digital capability plays a pivotal role in overcoming traditional internationalization barriers. By leveraging digital platforms and data-driven processes, firms can reduce transaction costs, streamline cross-border coordination, and access global markets more efficiently (Du & Huang, 2025). For MSMEs in particular, digital tools help bypass conventional constraints such as limited physical presence and resource scarcity, thereby expanding strategic reach and improving export performance (Trapeczyński & Kawa, 2023). Despite its strategic importance, prior research has largely examined human capital and digital capability in isolation. Studies on internationalization often focus on the direct effects of digitalization while overlooking its role as a mediating mechanism that translates human capital into global outcomes (Anwar et al., 2024). This fragmented

perspective limits our understanding of how resource-constrained firms effectively mobilize internal assets to achieve international competitiveness.

Addressing this gap, this study proposes that digital capability functions as a critical mediating mechanism that converts human capital into internationalization outcomes. Drawing on the Resource-Based View and Dynamic Capability Theory, we argue that competitive advantage stems not from resource ownership alone, but from a firm's ability to reconfigure and operationalize those resources in response to evolving market demands. In this context, digital capability serves as a strategic enabler that transforms human capital into market-oriented actions, helping firms navigate geographic and institutional barriers.

This research focuses on MSMEs in developing economies, where resource limitations and institutional constraints are particularly pronounced. Specifically, it examines teak woodcraft MSMEs in Bojonegoro, Indonesia—a sector characterized by rich local resource endowments and artisanal skills that reflect accumulated tacit knowledge (Devi et al., 2012; Rizanti et al., 2018). From a Resource-Based View perspective, teak wood and local craftsmanship represent valuable, rare, and difficult-to-imitate resources that can serve as a foundation for sustained competitive advantage (Ciszewska-Mlinarič & Wasowska, 2015; Lubis et al., 2026). However, these advantages remain underexploited due to limited capacity in transforming traditional resources into market-oriented international strategies (Inan, 2024; Mady et al., 2023; Quaye & Mensah, 2019). From a Dynamic Capability standpoint, these firms face challenges not in possessing resources, but in sensing global opportunities, seizing them through strategic responses, and reconfiguring existing capabilities to align with digital and international market demands. Despite the high economic and cultural value of teak-based products (Pumomo et al., 2011), their potential for global expansion remains constrained. Based on the identified research gap and theoretical foundation, this study aims to achieve the following objectives: (1) to examine the direct effect of human capital on the digital capability of teak woodcraft MSMEs; (2) to investigate the direct influence of human capital and digital capability on SME internationalization; and (3) to analyze the mediating role of digital capability in the relationship between human capital and internationalization. By addressing these objectives, the study seeks to provide empirical evidence on how internal resources are transformed into global competitiveness through digital mechanisms.

2. Literature Review

2.1 Human Capital Theory

Becker's Human Capital Theory suggests that employee knowledge, specialized skills, and managerial abilities are essential resources that influence organizational performance and strategic preparedness, especially in resource-limited SMEs. Recent research shows that human capital boosts productivity and engagement through focused training and skill development, with evidence indicating that training programs and e-learning significantly improve organizational results (Arokiasamy et al., 2025). In addition to core skills, human capital enhances absorptive capacity, enabling SMEs to acquire, interpret, and utilize external knowledge for innovation and gaining a competitive edge (Khalil, 2024), while technical expertise is associated with increased labor productivity and overall firm performance (Ismail, 2018). At the managerial level, adaptive managerial abilities and entrepreneurial leadership are vital for converting human capital into strategic initiatives, helping firms stay agile and responsive in unpredictable environments (Althawadi, 2025; Kusumawijaya et al., 2026). Moreover, the impact of human capital is strengthened when combined with organizational resources like digital technologies and social capital, where digital tools and HR systems support real-time decision-making and operational efficiency (Borazon et al., 2024; Thu & Tam, 2026). Overall, these findings highlight that human capital is more than just an individual trait; it is a strategic asset that, when integrated with technological resources and organizational processes, greatly enhances SME competitiveness and flexibility in fast-changing markets (Trequattrini et al., 2025).

2.2 Dynamic Capability Theory

Within the framework of Dynamic Capability Theory, digital capability is increasingly conceptualized as a firm's ability to sense, seize, and transform in response to technological change and environmental uncertainty, thereby enabling sustained competitiveness. Recent studies define digital capability as the capacity to leverage digital technologies to identify emerging opportunities and threats (sensing), exploit these opportunities through innovative strategies and business model reconfiguration (seizing), and continuously adapt organizational

processes and resources (transforming) (Goraya et al., 2025; Saka et al., 2025). As a core dynamic capability, it plays a critical role in enhancing organizational agility, innovation, and resilience, particularly in contexts characterized by rapid digital transformation and market turbulence (Luo & Chaiprasit, 2024). Empirically, digital capability is commonly operationalized through dimensions such as digital sensing capabilities, digital operational capabilities, and digital resource collaboration, which collectively reflect a firm's ability to integrate internal and external digital resources to support value creation and strategic adaptation (Tian et al., 2025). Prior research further demonstrates that digital capability not only directly improves firm performance but also acts as a mediating mechanism linking digital transformation initiatives to outcomes such as business model innovation, resilience, and competitive advantage (Durman et al., 2025). Overall, these findings highlight that digital capability is not merely a technological asset but a strategic dynamic capability that enables firms, particularly SMEs, to navigate uncertainty, reconfigure resources, and sustain performance in increasingly digitalized markets (L. Liu et al., 2022).

2.3 SME Internationalization Theory

SME internationalization has been widely explained through two dominant theoretical lenses, namely the Uppsala Model and International Entrepreneurship (IE) theory, which offer complementary perspectives in understanding firms' expansion into global markets. The Uppsala Model conceptualizes internationalization as a gradual and sequential process driven by experiential learning, where firms incrementally increase their commitment to foreign markets as knowledge accumulates and uncertainty is reduced (Hult et al., 2020). Recent adaptations extend this model by incorporating network relationships, recognizing that business networks facilitate opportunity identification and reduce entry barriers in increasingly complex environments (Forsgren, 2016). However, the model is often criticized for its limited ability to explain rapid internationalization, particularly in the case of born-global firms and the growing role of digital technologies in accelerating market entry (Kubičková, 2014). In contrast, International Entrepreneurship theory emphasizes proactive, opportunity-driven behavior, where entrepreneurs leverage cognitive capabilities, networks, and digital platforms to identify and exploit international opportunities quickly, often bypassing traditional stages of expansion (Sakhdari & Saniei, 2018). This perspective is particularly relevant in the digital era, where technological advancements significantly lower barriers to entry and enable real-time global market engagement (Hoxholli & Kercini, 2018). Nevertheless, IE theory may underemphasize the importance of gradual learning and long-term capability development necessary for sustaining international operations (Alinasab & Hunt, 2025). Therefore, integrating insights from both frameworks provides a more comprehensive understanding of SME internationalization, combining the structured, learning-based approach of the Uppsala Model with the agility and opportunity orientation emphasized in International Entrepreneurship theory (Sakhdari & Saniei, 2018).

2.4 Effect of Human Capital on Digital Capability

Human capital is a fundamental determinant in the development of digital capabilities within Micro, Small, and Medium Enterprises (MSMEs), where education, professional skills, and learning agility form the foundation for adopting and utilizing digital technologies (Daat et al., 2021; Faisol et al., 2021). This human capacity enables organizations to identify and transform digital opportunities through comprehensive knowledge management and organizational learning mechanisms (Kumar et al., 2023; J. Wu et al., 2024). Furthermore, proficient human resources facilitate participation in knowledge-sharing networks and external collaborations, which are vital for MSMEs to overcome financial constraints and enhance digital resilience (Dvorský et al., 2020). Therefore, investments in employee competency development and upskilling strategies directly enhance an organization's capacity to navigate technological transformation (Faria et al., 2023; Jiang & Shi, 2023).

2.5 Digital Capability's Influence on Internationalization

Digital capability functions as an essential enabler that supports a company's internationalization process through enhanced business model innovation, digital preparedness, and dynamic capabilities (Anwar et al., 2024; Nurfaizal et al., 2025). The deployment of digital platforms, ICT literacy, and virtual networks directly augment access to global markets for small and medium-sized enterprises (SMEs) and expedite international expansion by mitigating geographic barriers (Fu & Abdul Rahim, 2025; Grginović, 2025). Although digital transformation may initially increase transaction complexity, it has been demonstrated that, in the long term, this capability broadens the depth and scope of international markets, particularly for firms that integrate digital strategies with organizational processes (Huang et al., 2026; Kim, 2024). Moreover, advantages derived from

digital ownership, such as infrastructure and technology, are vital for "Internet Born Globals" to identify international opportunities and adopt innovative market entry strategies from the outset (Cahen et al., 2025; Zheng & Sun, 2022).

2.6 Human Capital and Internationalization Performance

Human capital is a crucial resource that directly impacts a company's success in international markets by offering essential skills, market insights, and strategic capabilities needed to manage foreign market complexities (Kidwell et al., 2020). In particular, the skills of the top management team (TMT) and the board of directors—such as their educational background, international experience, and technical knowledge—are vital for formulating informed global expansion strategies and boosting innovation efficiency abroad (Barriga & Escandon-Barbosa, 2024; Zhong et al., 2021). This strategic human capital provides a sustainable competitive edge when aligned with corporate goals (Yan-Li et al., 2011), and also supports intellectual capital by turning global knowledge into better performance (Andreu et al., 2024, 2025). While its operational effectiveness can be influenced by institutional factors, industry growth, and certain optimal boundaries within the technology sector (Y. Liu et al., 2022; Ndofirepi, 2024), there is widespread academic agreement that the quality of human capital is a key predictor of successful entry into global markets.

2.7 Mediating Role of Digital Capability

The literature comprehensively positions Digital Capability as a critical mediator that bridges internal resources and organizational strategies to improve performance, innovation, and competitive advantage. This digital capability has been proven to facilitate the transformation of technology investments into tangible outcomes by increasing organizational agility and optimizing knowledge processing processes (Bellaa, 2025; Jing et al., 2023; W. Wu et al., 2024). Furthermore, Digital Capability functions as a catalyst that converts digital transformation and a company's absorptive capacity into superior innovation performance, thereby enabling more effective integration of external knowledge (Van Hoang et al., 2025; Wang et al., 2022). In the context of SMEs and e-commerce-based businesses, this capability crucially mediates the influence of leadership and external factors on business performance, while aligning organizational initiatives with market competitiveness (Faradiba et al., 2025; Mendo et al., 2025; Rehman, 2025). Given its vital role in translating strategic resources—such as the competencies of Human Capital—into accelerated performance outcomes and competitiveness in the broader market, the fourth hypothesis is as follows.

2.8 Hypothesis Development

Drawing on the Resource-Based View and Dynamic Capability Theory, this study posits that competitive advantage in international markets stems not merely from resource ownership, but from a firm's capacity to reconfigure and operationalize those resources through digital mechanisms. The following hypotheses are formally developed based on the theoretical and empirical synthesis presented in the preceding sections.

First, human capital, which encompasses managerial expertise, technical skills, and learning agility, serves as the foundational input for building organizational digital competencies. Firms with higher-quality human resources are better equipped to adopt, integrate, and leverage digital technologies, thereby enhancing their digital capability. This leads to the first hypothesis:

H1: Human Capital has a positive impact on Digital Capability.

Second, digital capability enables firms to overcome traditional barriers to internationalization by reducing transaction costs, expanding market reach, and facilitating cross-border coordination. Through digital platforms and data-driven decision-making, MSMEs can identify global opportunities and respond rapidly to international market demands. Thus:

H2: Digital Capability has a positive and significant effect on Internationalization.

Third, human capital directly contributes to internationalization by providing the strategic knowledge, cross-cultural understanding, and managerial competencies required to navigate foreign markets. Experienced and skilled leadership enhances a firm's readiness to engage in export activities and global partnerships. Therefore:

H3: Human Capital has a positive and significant effect on Internationalization.

Finally, while human capital provides the necessary knowledge and skills, its impact on international outcomes is significantly amplified when translated into actionable digital strategies. Digital capability functions as the critical conversion mechanism that operationalizes human capital into market-oriented capabilities, bridging internal resources and external competitive performance. Accordingly:

H4: Digital Capability mediates the relationship between Human Capital and Internationalization.

2.9 Ethical Considerations

This study was conducted in strict accordance with established ethical guidelines for social science research involving human participants. Prior to data collection, all participants were provided with a comprehensive information sheet detailing the study's objectives, procedures, and their rights. Written informed consent was obtained from each respondent, emphasizing that participation was entirely voluntary and that they could withdraw at any time without consequence. To ensure confidentiality and data privacy, all personal identifiers were removed during data entry and analysis. The anonymized dataset was stored securely and used exclusively for academic research purposes.

3. Methods

This study employed a quantitative explanatory survey design. A non-probability sampling technique, specifically purposive sampling, was employed to select respondents who met the following criteria: (1) being owners or managers of teak woodcraft MSMEs located in Bojonegoro Regency, East Java, Indonesia; (2) having operational experience of at least two years; and (3) possessing export experience or demonstrable potential for international market engagement. Through this approach, a final sample of 150 respondents was obtained to examine the structural relationships among Human Capital, Digital Capability, and Internationalization. These three constructs were measured using a five-point Likert scale based on several representative indicators adapted from prior studies. Specifically, Human Capital was measured through business experience and problem-solving abilities (Tong et al., 2019), Digital Capability was assessed based on the adoption of digital technologies and analytics (Tong et al., 2019), and Internationalization was reflected in export performance and the speed of response to global market opportunities (Luu et al., 2026).

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), following the guidelines proposed by (Hair et al., 2021). The evaluation of the measurement model (outer model) indicated that the instrument demonstrated satisfactory quality, as evidenced by the fulfillment of convergent validity criteria (outer loadings > 0.708 and AVE > 0.50), construct reliability (Cronbach's Alpha and Composite Reliability > 0.70), discriminant validity (Fornell–Larcker criterion), and the absence of multicollinearity (VIF < 5).

Subsequently, the structural model (inner model) was assessed by examining its explanatory power (R^2) and predictive relevance ($Q^2 > 0$). Hypotheses (H1–H4) were then tested using a bootstrapping procedure with 5,000 subsamples, where relationships were considered statistically significant if the T-statistics exceeded 1.96 and the p-values were below 0.05 (Hair et al., 2021).

4. Results

4.1 Convergent Validity and Reliability Test

The assessment of the measurement model was conducted to ensure the reliability and convergent validity of the constructs prior to testing the structural relationships. This evaluation employed several established criteria, including indicator loadings, internal consistency reliability (Cronbach's alpha, ρ_a , and composite reliability), and convergent validity as measured by the average variance extracted (AVE). Following commonly accepted thresholds, indicator loadings should exceed 0.70, while Cronbach's alpha and composite reliability should be above 0.70, and AVE should be greater than 0.50. Meeting these criteria indicates that the indicators adequately represent their respective latent constructs and that the measurement model is suitable for further analysis.

As reported in Table 1, all constructs demonstrate satisfactory levels of reliability and convergent validity. For Human Capital, the outer loadings range from 0.745 to 0.866, indicating strong indicator reliability. The construct also exhibits high internal consistency, with Cronbach's Alpha of 0.936, rho_A of 0.938, and Composite Reliability of 0.946. The AVE value of 0.636 further confirms adequate convergent validity. Similarly, Digital Capability shows consistently high indicator loadings, ranging from 0.766 to 0.841, alongside excellent reliability indices (Cronbach's Alpha = 0.964, rho_A = 0.965, Composite Reliability = 0.968) and an AVE of 0.667, indicating a substantial proportion of variance explained by the construct. The Internationalization construct also meets all recommended thresholds, with loadings between 0.738 and 0.855, Cronbach's Alpha of 0.938, rho_A of 0.940, Composite Reliability of 0.947, and an AVE of 0.641. Collectively, these results confirm that all constructs achieve adequate internal consistency and convergent validity, supporting the robustness of the measurement model and justifying its use for subsequent structural model evaluation.

Table 1. Measurement Model Results

Variable	Items	Loading Factor	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Human Capital	HC1	0.792	0.936	0.938	0.946	0.636
	HC2	0.745				
	HC3	0.784				
	HC4	0.779				
	HC5	0.866				
	HC6	0.807				
	HC7	0.786				
	HC8	0.790				
	HC9	0.838				
	HC10	0.782				
Digital Capability	DC1	0.841	0.964	0.965	0.968	0.667
	DC2	0.835				
	DC3	0.828				
	DC4	0.810				
	DC5	0.820				
	DC6	0.831				
	DC7	0.828				
	DC8	0.806				
	DC9	0.802				
	DC10	0.820				
	DC11	0.799				
	DC12	0.805				
	DC13	0.836				
	DC14	0.766				
	DC15	0.819				
Internationalization	INT1	0.795	0.938	0.940	0.947	0.641
	INT2	0.803				
	INT3	0.855				
	INT4	0.817				
	INT5	0.738				
	INT6	0.823				
	INT7	0.814				
	INT8	0.739				
	INT9	0.828				
	INT10	0.790				

4.2 Discriminant Validity

The discriminant validity of the constructs was assessed using the Fornell–Larcker criterion. As shown in Table 2, the square root mean of the Average Variance Extracted (AVE) for each construct was higher than its correlation with other constructs. Specifically, Digital Capability had a square root mean of AVE of 0.817,

which exceeded its correlation with Human Capital (0.685) and Internationalization (0.670). Similarly, Human Capital showed a square root mean of AVE of 0.798, which was greater than its correlation with Internationalization (0.605). The Internationalization construct also met this criterion, with a square root mean of AVE of 0.801, exceeding its correlation with other constructs.

Table 2. Discriminant Validity (Fornell–Larcker Criterion)

	Digital Capability	Human Capital_	Internationalization_
Digital Capability	0.817		
Human Capital_	0.685	0.798	
Internationalization_	0.670	0.605	0.801

These results indicate that each construct shares more variance with its own indicators than with other constructs, thus confirming adequate discriminant validity. In other words, Digital Capability, Human Capital, and Internationalization are empirically distinct and measure different conceptual domains within the model. These findings support the robustness of the measurement model and indicate that the constructs can be used reliably in further structural analyses.

4.3 Testing Hypotheses

The structural model was evaluated by examining the path coefficients, their statistical significance, and the indirect effects among constructs. The assessment relies on the magnitude of the original sample estimates, t-statistics, and p-values to determine the strength and significance of the hypothesized relationships. A path is considered significant when the t-statistic exceeds 1.96 and the p-value is below 0.05, indicating robust empirical support for the proposed relationships.

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As shown in Table 3, Human Capital exhibits a strong, positive, and statistically significant effect on Digital Capability ($\beta = 0.685$, $t = 16.176$, $p < 0.001$). This standardized path coefficient indicates that a one standard deviation increase in human capital is associated with a 0.685 standard deviation increase in digital capability, holding other factors constant. In practical terms, this suggests that investments in employee competencies, including managerial expertise, technical skills, and learning agility, yield substantial returns in enhancing a firm's digital readiness and technological adoption capacity.

Furthermore, Digital Capability demonstrates a positive and significant influence on Internationalization ($\beta = 0.482$, $t = 6.336$, $p < 0.001$). This finding implies that firms with stronger digital infrastructures and data-driven decision-making processes are better positioned to overcome traditional barriers to global market entry, such as geographic distance and information asymmetry. The magnitude of this effect underscores digital capability as a strategic enabler for MSMEs seeking to expand internationally.

Human Capital also exerts a direct, positive, and significant effect on Internationalization ($\beta = 0.275$, $t = 3.439$, $p = 0.001$), although the effect size is notably smaller compared to its indirect pathway through Digital Capability. This pattern suggests that while human capital contributes to internationalization through knowledge, experience, and strategic decision-making, its impact is substantially amplified when mediated by digital mechanisms.

Table 3. Structural Model Results (Direct Effects)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
DC → INT	0.482	0.480	0.076	6.336	0.000
HC → DC	0.685	0.688	0.042	16.176	0.000
HC → INT	0.275	0.279	0.080	3.439	0.001

The mediation analysis (Table 4) confirms that Digital Capability significantly mediates the relationship between Human Capital and Internationalization. The indirect effect is positive and statistically significant ($\beta = 0.330$, $t = 5.863$, $p < 0.001$), supporting a partial mediation mechanism. This indicates that human capital enhances internationalization not only through direct contributions but also, to a greater extent, by first building digital capability, which then facilitates global market engagement. Collectively, these results highlight that digital capability functions as a critical conversion mechanism that operationalizes human capital into tangible international outcomes.

Table 4. Indirect Effect (Mediation Analysis)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
HC → DC → INT	0.330	0.330	0.056	5.863	0.000

Note: HC = Human Capital; DC = Digital Capability; INT = Internationalization.

In addition to the direct effects, the mediation analysis reveals that Digital Capability significantly mediates the relationship between Human Capital and Internationalization. The indirect effect is positive and significant, with a coefficient of 0.330, a t-statistic of 5.863, and a p-value of 0.000. This finding indicates that Human Capital enhances Internationalization not only directly but also indirectly through the development of Digital Capability. Collectively, these results suggest a partial mediation mechanism, where Digital Capability serves as an important intervening variable that strengthens the impact of Human Capital on Internationalization.

5. Discussion

The findings of this study furnish compelling empirical evidence supporting the pivotal role of human capital as a fundamental driver of digital capability within MSMEs. The notable and substantial influence of human capital on digital capability underscores the importance of employee competencies, managerial expertise, and learning capacity in facilitating effective adoption and utilization of digital technologies by firms. This outcome aligns with prior scholarly research emphasizing that human capital bolsters organizational learning, knowledge absorption, and technological adaptation (Daat et al., 2021; Kumar et al., 2023; J. Wu et al., 2024). In the context of teak wood craft MSMEs, this implies that traditional artisanal knowledge alone is inadequate unless augmented by digital skills and adaptive capacities. Consequently, human capital should be regarded not merely as a static resource but as an active catalyst for technological transformation within organizations.

Moreover, the results indicate that digital capability positively and significantly influences internationalization, underscoring its strategic significance in overcoming conventional barriers to entry into global markets. This finding corroborates the proposition that digital technologies empower firms to access international markets more efficiently by lowering transaction costs, improving communication, and broadening market reach (Anwar et al., 2024; Fu & Abdul Rahim, 2025; Grginović, 2025). For MSMEs operating in resource-constrained environments, digital capability acts as a critical leverage point, compensating for limitations in physical infrastructure and international networks. Consistent with the dynamic capability perspective, this capability enables firms to identify and capitalize on international opportunities while adapting their business models to meet global market demands (Goraya et al., 2025; Tian et al., 2025).

Besides the indirect pathway, human capital also has a direct and statistically significant impact on internationalization, though with a smaller effect size. This indicates that while human capital helps firms expand globally through knowledge, experience, and strategic decision-making, its effectiveness is greater when supported by appropriate organizational mechanisms. This observation is consistent with earlier research indicating that human capital enhances international performance by equipping firms with essential managerial and market-oriented competencies (Barriga & Escandon-Barbosa, 2024; Kidwell et al., 2020; Zhong et al., 2021). Nonetheless, the relatively lower coefficient implies that human capital alone may be insufficient to drive internationalization without support from complementary capabilities, especially in digitally intensive environments.

The mediation analysis notably confirms that digital capability is a key intermediary in turning human capital into successful internationalization results. This supports the idea that resources alone do not confer a

competitive edge unless they are converted into effective capabilities (Feliciano-Cestero et al., 2023; Melén & Nordman, 2007). In this case, digital capability acts as a strategic tool that helps transform human capital into market-focused actions, enhancing a firm's ability to compete globally. This finding also agrees with earlier research highlighting the mediating role of digital capability in connecting internal resources to firm performance and innovation (Van Hoang et al., 2025; Wang et al., 2022). Overall, the results underscore the importance of an integrated approach that considers not only resource ownership but also the firm's ability to reconfigure and utilize these resources in a fast-changing digital environment.

6. Conclusion

The findings of this study conclusively demonstrate that human capital constitutes a critical antecedent of digital capability and internationalization within MSMEs. Human capital not only exerts a strong and significant influence on digital capability, but also directly contributes to internationalization, albeit with a relatively smaller effect size. This indicates that while managerial competence, experience, and learning capacity are essential in driving firms toward global markets, their effectiveness is substantially amplified when aligned with the firm's ability to adopt and utilize digital technologies. Thus, human capital should be conceptualized as a dynamic and enabling resource that requires complementary organizational capabilities to generate optimal strategic outcomes.

Furthermore, this study confirms the central mediating role of digital capability in transforming human capital into internationalization performance. Digital capability serves as a strategic conduit through which internal resources are translated into market-oriented actions, enabling MSMEs to overcome resource constraints and compete in international markets. These results reinforce the dynamic capability perspective, emphasizing that competitive advantage is not derived solely from resource possession, but from the firm's ability to reconfigure and leverage those resources in response to a rapidly evolving digital environment. Accordingly, an integrative approach that simultaneously develops human capital and digital capability is imperative for fostering sustainable internationalization among MSMEs.

7. Limitation of the Study

Despite its theoretical and practical contributions, this study is subject to several limitations that warrant acknowledgment and suggest directions for future research. First, from a methodological perspective, the cross-sectional research design captures data at a single point in time, which limits the ability to draw definitive causal inferences regarding the dynamic relationships between human capital, digital capability, and internationalization. Although PLS-SEM is robust for predictive modeling, longitudinal designs would provide stronger evidence of temporal causality. Additionally, while the sample size of 150 respondents meets the minimum requirements for PLS-SEM analysis, it restricts the capacity to conduct advanced multi-group comparisons or capture broader industry-level trends.

Second, the study is contextually bounded to teak woodcraft MSMEs operating in Bojonegoro Regency, Indonesia. This sector is characterized by unique traditional craftsmanship, localized resource endowments, and specific institutional conditions. Consequently, the findings may not be directly generalizable to other manufacturing sub-sectors, service-oriented MSMEs, or firms operating in different geographic and cultural environments. Future research could extend this framework by examining diverse industrial contexts or conducting cross-regional comparisons to enhance the external validity of the proposed model.

Third, the reliance on self-reported survey data introduces the potential for common method bias and subjective perception gaps. Although procedural safeguards such as respondent anonymity, clear instrument instructions, and validated scales were employed to mitigate these concerns, future studies would benefit from incorporating multi-source data, such as managerial assessments combined with objective export records or digital adoption metrics. Triangulating quantitative findings with qualitative insights through interviews or case studies could also provide a more nuanced understanding of the strategic processes underlying digital transformation and internationalization.

Consent

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

Disclaimer (Artificial Intelligence)

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology.

Details of the AI usage are given below:

1. ChatGPT, to support language refinement and improve the clarity of the manuscript. These tools were utilized solely for editing purposes, such as grammar correction, paraphrasing, and readability enhancement, and did not contribute to the study design, data analysis, or interpretation of the research findings. All intellectual content, arguments, and conclusions presented in this study remain the sole responsibility of the authors.

Competing Interests

Authors have declared that no competing interests exist.

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