

# Intellectual Capital as Mediator Between Organizational Culture, Risk Management, and Construction Company Performance

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## Abstract

**Purpose:** This study examines the influence of organizational culture and risk management on company performance, with intellectual capital functioning as a mediating variable, in the context of Indonesian construction companies.

**Methodology:** A quantitative research design was employed, with structured questionnaires administered to 281 respondents drawn through purposive sampling from eight established construction firms operating in Indonesia for more than five years. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0, evaluating both direct and indirect effects.

**Results:** Organizational culture significantly and positively influenced intellectual capital ( $\beta = 0.620$ ,  $p < 0.001$ ), as did risk management ( $\beta = 0.229$ ,  $p = 0.039$ ). Intellectual capital demonstrated the strongest positive effect on company performance ( $\beta = 0.911$ ,  $p < 0.001$ ), whereas the direct effect of organizational culture on performance was not significant. Risk management had a significant direct positive effect on performance. Mediation analysis confirmed that intellectual capital fully mediates the relationship between organizational culture and company performance ( $\beta = 0.565$ ,  $p < 0.001$ ) and partially mediates the relationship between risk management and performance ( $\beta = 0.209$ ,  $p = 0.040$ ).

**Conclusions:** Intellectual capital is the critical conduit through which organizational culture and risk management drive company performance in Indonesian construction firms.

**Limitations:** The cross-sectional design and focus on eight firms limit generalizability.

**Contributions:** This research offers theoretical and empirical novelty by integrating intellectual capital as a mediating mechanism within the organizational performance model specifically for the Indonesian construction sector.

**Keywords:** *Company Performance, Intellectual Capital, Organizational Culture, Risk Management, Strategic Resources*

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## 1. Introduction

The Indonesian construction industry represents one of the most strategically significant sectors of the national economy, contributing 9.92% to GDP in 2023 and ranking fifth among all economic sectors ([Rahardi & Johari, 2022](#); [Purwanti & Heriana, 2024](#)). Driven by large-scale government infrastructure initiatives such as the Trans-Sumatra Toll Road and the Nusantara Capital City relocation project, the sector is targeted to achieve annual growth of 6.4% to 6.7%. However, despite this impressive economic significance, the industry continues to grapple with persistent operational challenges including material price volatility, low labor productivity, project delays, cost overruns, and escalating technical risks ([Boateng, Ameyaw, & Mensah, 2022](#)). These challenges collectively undermine the long-term business performance of construction firms and necessitate a deeper examination of the internal organizational factors that influence corporate outcomes.

Organizational culture has emerged as a foundational determinant of corporate performance across diverse industries. In construction firms, where cross-functional teamwork, strict project timelines, and safety compliance are paramount, the prevailing cultural norms and values significantly shape how resources are mobilized and how personnel collaborate ([Nurmiati et al., 2022](#); [Osman et al., 2023](#)). A performance-oriented culture that fosters openness, continuous learning, and professional accountability has been empirically linked to improved project outcomes, enhanced innovation capacity, and stronger organizational effectiveness ([Odor, 2018](#); [Muntu et al., 2021](#)). Conversely, a culture characterized by rigidity, information hoarding, and lack of trust tends to impede coordination and organizational adaptability, ultimately diminishing corporate performance ([Nugraha, Soelistya, & Desembrianita, 2024](#)).

Risk management represents another critical strategic capability in the construction context, where inherent uncertainty permeates every phase of project delivery. Effective identification, assessment, and mitigation of financial, operational, and reputational risks have been shown to reduce project failures, improve stakeholder satisfaction, and enhance firm-level performance ([Songling et al., 2018](#); [Alshehhi et al., 2021](#)). [Purwanti and Heriana \(2024\)](#) demonstrated that construction firms listed on the Indonesia Stock Exchange that implemented structured risk management frameworks achieved superior financial performance outcomes. [Furthermore, Song et al. \(2025\)](#) found that embedding risk management into project processes contributed significantly to sustainable performance through stronger stakeholder engagement, suggesting that risk management should be viewed not merely as a defensive mechanism but as a strategic enabler.

Intellectual capital, comprising human capital, structural capital, and relational capital, constitutes the portfolio of intangible assets that drive organizational innovation and competitiveness ([de Frutos-Belizón et al., 2019](#); [Duodu & Rowlinson, 2021](#)). In the knowledge-based construction economy, firms that effectively leverage the expertise of their workforce, institutionalize knowledge through robust systems and processes, and build strong client and partner networks are better positioned to deliver complex projects and sustain performance advantages. [Sucena et al. \(2024\)](#) confirmed that intellectual capital significantly influences performance outcomes among small and medium-sized construction firms, while [Wijayani et al. \(2019\)](#) demonstrated its mediating role in the relationship between corporate culture and financial performance in the Indonesian banking sector. Despite these advances, the mediating function of intellectual capital specifically within Indonesian construction companies remains underexplored.

Existing research has examined organizational culture, risk management, and intellectual capital in relative isolation, rarely integrating them within a single structural model applicable to the construction sector ([Hashim et al., 2022](#); [Zhang et al., 2025](#)). This gap is particularly acute in the context of emerging market construction industries, where contextual factors such as regulatory environment, infrastructure demand cycles, and workforce characteristics create unique performance dynamics. Most international studies on intellectual capital as a mediator have been conducted in manufacturing or financial services contexts, leaving the construction industry underrepresented in the empirical literature ([Osman et al., 2023](#)).

This study addresses these gaps by proposing and empirically testing an integrated model in which organizational culture and risk management serve as exogenous variables, intellectual capital functions as a mediating variable, and company performance is the endogenous outcome. The novelty of this research lies in its contextual specificity, testing this integrative framework within Indonesian construction companies and employing PLS-SEM to capture both direct and indirect structural relationships. This study therefore aims to examine the direct effects of organizational culture and risk management on intellectual capital assess the direct effects of these variables alongside intellectual capital on company performance and determine whether intellectual capital mediates the relationships between organizational culture, risk management, and company performance in Indonesian construction firms.

## **2. Literature Review and Hypothesis/es Development**

### **2.1 Organizational Culture**

Organizational culture is broadly defined as the shared system of values, beliefs, norms, and behaviors that govern how individuals within an organization interact, make decisions, and respond to external demands ([Odor, 2018](#); [Bradigan & Hartel, 2019](#)). It functions as the organizational personality, encoding assumptions about work, relationships, and performance that are transmitted across generations of employees and embedded in standard operating procedures, reward systems, and leadership styles ([Nugraha, Soelistya, & Desembrianita, 2024](#)). In construction firms, where multi-disciplinary teams must collaborate under significant time, budget, and quality pressures, the cultural fabric of an organization directly determines whether coordination is efficient, communication is open, and innovation is encouraged ([Nurmiati, Wahyudi, Rusydi, Farild, & Bakhtiar, 2022](#)).

Schein's model of organizational culture conceptualizes culture at three levels, artifacts (visible structures and processes), espoused values (strategies and goals), and underlying assumptions (unconscious beliefs and perceptions). When these three levels are aligned toward performance-oriented goals, organizations are more likely to achieve strategic coherence and competitive advantage ([Joshi & Tiwari, 2019](#)). In the Indonesian construction industry, where clan and hierarchy cultures have been traditionally dominant, a gradual shift toward market and adhocracy cultures has been observed, driven by the demands of large-scale national infrastructure projects that require higher innovation and agility ([Rani & Indrayanti, 2020](#)). Hussain [Al-Hashimy et al. \(2022\)](#) demonstrated that construction companies with technology-embracing cultures achieved measurably better economic performance, confirming that cultural orientation is a significant predictor of organizational outcomes.

The relationship between organizational culture and intellectual capital is well-established in the literature. A culture that values knowledge sharing, continuous learning, and cross-functional collaboration naturally builds human and structural capital over time by encouraging employees to develop expertise, codify best practices, and build relational networks ([Attar, Kang, & Sohaib, 2018](#)). In contrast, cultures characterized by information silos, blame attribution, and status hierarchy tend to erode intellectual capital by discouraging mentorship, experimentation, and knowledge transfer. [Gultom and Lubis \(2023\)](#) found that Indonesian construction firms with strong collaborative cultures reported significantly higher levels of knowledge management effectiveness, confirming the culture-intellectual capital linkage in an emerging market context.

### **2.2 Risk Management**

Risk management in the construction industry encompasses the systematic processes of identifying, analyzing, evaluating, and responding to uncertainties that may threaten project objectives or firm-level outcomes ([Songling et al., 2018](#); [Liu, 2019](#)). Given the complex, project-based nature of construction work, risks are multidimensional, encompassing financial risks (cost overruns, payment defaults), technical risks (design errors, material failures), operational risks (labor shortages, equipment breakdowns), and strategic risks (regulatory changes, market demand shifts). Effective risk management requires not only formal frameworks but also a risk-aware organizational culture in

which personnel at all levels are empowered to identify and report emerging risks proactively ([Rahardi & Johari, 2022](#)).

Empirical evidence consistently demonstrates that construction firms with structured enterprise risk management frameworks achieve superior performance outcomes. [Alshehhi et al. \(2021\)](#) found that risk management maturity was a significant predictor of project performance in terms of cost, time, and quality across Gulf Cooperation Council construction markets. [Boateng et al. \(2022\)](#) confirmed similar findings in the Ghanaian construction sector, demonstrating that systematic risk monitoring and response planning reduced project delays by an average of 23%. In the Indonesian context, [Purwanti and Heriana \(2024\)](#) showed that financial risk management adoption among listed construction companies on the IDX was positively associated with return on assets and return on equity, underscoring its strategic financial value.

Beyond direct performance effects, risk management enhances intellectual capital by creating an environment where knowledge-based assets are protected and leveraged systematically. [Bulatetskaya \(2019\)](#) argued that effective intellectual property risk management preserves the value of human expertise and proprietary processes, preventing the erosion of structural capital through employee turnover, project failures, or technology theft. [Wijaya and Mulyantini \(2023\)](#) further demonstrated that firms with comprehensive risk disclosure practices were better able to attract institutional investors and talent, strengthening their relational and human capital. This suggests that risk management serves a dual role, such as protecting existing intellectual capital and creating conditions conducive to new knowledge development.

### **2.3 Intellectual Capital**

Intellectual Capital (IC) encompasses the sum of an organization's intangible resources, comprising human capital (the skills, knowledge, experience, and innovative capacity of employees), structural capital (organizational processes, information systems, patents, and institutional routines), and relational capital (the quality and depth of relationships with clients, suppliers, partners, and communities) ([Komnenić & Pulić, 2021](#)). In the construction industry, where project success depends heavily on the expertise of engineers and project managers, the efficiency of planning and coordination processes, and the strength of client and subcontractor relationships, intellectual capital represents a fundamental source of competitive differentiation ([Duodu & Rowlinson, 2021](#)).

The measurement of intellectual capital remains a complex challenge for researchers and practitioners alike. [Strelnikova \(2022\)](#) highlighted the absence of a universally accepted method for IC quantification, with approaches ranging from market-to-book value ratios to composite indices based on the Value Added Intellectual Coefficient (VAIC). Despite these methodological challenges, the empirical literature consistently confirms that higher levels of IC are associated with superior innovation performance, stronger project management outcomes, and greater long-term profitability ([Khan, 2018](#); [Sucena et al., 2024](#)). In the Indonesian construction sector, [Gunawan and Widodo \(2022\)](#) demonstrated that companies with robust IC management practices significantly outperformed their competitors on multiple financial and operational metrics.

Intellectual capital also plays a critical mediating role in translating organizational factors into performance outcomes. [Hashim et al. \(2022\)](#) proposed that IC serves as the mechanism through which strategic organizational resources are converted into measurable value for stakeholders. Specifically, when a supportive organizational culture enhances employee expertise and knowledge sharing, and when effective risk management institutionalizes protective and enabling routines, the resulting intellectual capital generates innovation, efficiency improvements, and relational advantages that ultimately drive company performance ([Osman et al., 2023](#); [Zhang et al., 2025](#)). This mediating function is particularly important in knowledge-intensive sectors such as construction, where the ability to apply accumulated organizational knowledge to complex, non-routine project challenges is a primary driver of competitive success.

## 2.4 Company Performance

Company performance is a multidimensional construct capturing the extent to which a firm effectively achieves its strategic, operational, and financial objectives ([Irmalasari, Gurendrawati, & Muliastari, 2022](#)). In the construction industry, performance is typically assessed across financial dimensions (profitability, return on investment, revenue growth), project-level dimensions (cost compliance, schedule adherence, quality delivery), and strategic dimensions (market share, client satisfaction, innovation output) ([Sasanti, Animah, & Fikri, 2023](#)). [Daniali et al. \(2020\)](#) emphasized that performance evaluation must be benchmarked against predetermined organizational goals and industry standards to generate meaningful insights for managerial decision-making.

The Resource-Based View (RBV) of the firm provides a strong theoretical foundation for understanding how organizational capabilities such as culture, risk management, and intellectual capital contribute to sustained performance advantages. According to RBV, firms that possess resources that are valuable, rare, inimitable, and non-substitutable are more likely to achieve superior and sustained performance outcomes. Intellectual capital, with its inherent complexity, firm-specificity, and embeddedness in social relationships and organizational routines, satisfies all four RBV criteria, making it a uniquely powerful predictor of long-term company performance in competitive construction markets ([Asir, Yuniawati, Mere, Sukardi, & Anwar, 2023](#)).

## 2.5 Hypothesis Development

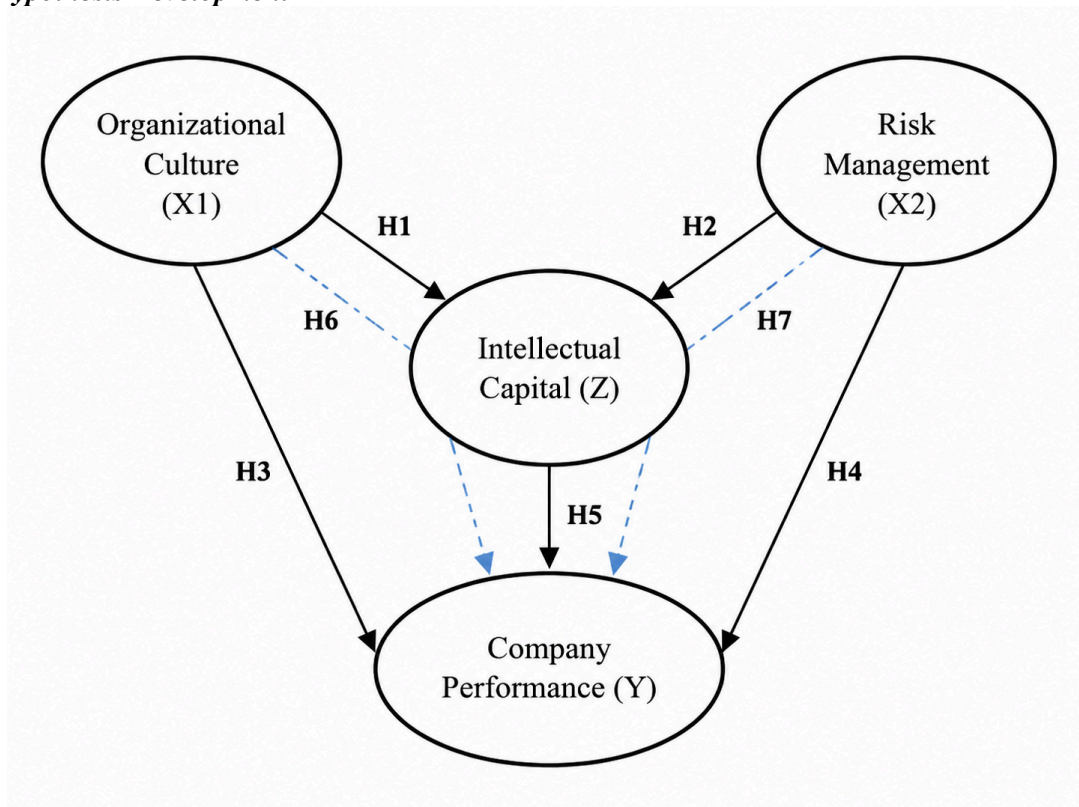


Figure 1. Hypotheses

Figure 1 building on the theoretical foundations described above, this study develops seven research hypotheses.  $H_1$  proposes that organizational culture significantly and positively influences intellectual capital, consistent with findings by [Attar et al. \(2018\)](#) and [Osman et al. \(2023\)](#).  $H_2$  proposes that risk management significantly and positively influences intellectual capital, supported by [Bulatetskaya \(2019\)](#) and [Wijaya and Mulyantini \(2023\)](#).  $H_3$  proposes that organizational culture has a significant positive direct effect on company performance, as suggested by [Nurmiati et al. \(2022\)](#), although this relationship may be mediated by IC.  $H_4$  proposes that risk management significantly and positively affects company performance, consistent with [Purwanti and Heriana \(2024\)](#) and [Song et al. \(2025\)](#).  $H_5$

proposes that intellectual capital significantly and positively influences company performance, supported by [Duodu and Rowlinson \(2021\)](#), and [Sucena et al. \(2024\)](#).  $H_6$  proposes that intellectual capital significantly mediates the relationship between organizational culture and company performance, consistent with [Reza and Silalahi \(2021\)](#) and [Sustrastanti and Rachmawati \(2023\)](#).  $H_7$  proposes that intellectual capital significantly mediates the relationship between risk management and company performance, supported by [Ardina and Novita \(2023\)](#) and [Indawati et al. \(2024\)](#).

### 3. Research Methodology

This study adopts a quantitative explanatory research design to examine the structural relationships among organizational culture, risk management, intellectual capital, and company performance within Indonesian construction companies. The quantitative approach was selected to enable statistical hypothesis testing and precise measurement of latent constructs ([Hair, Hult, Ringle, Sarstedt, Danks, & Ray, 2021](#)). The population comprised construction companies operating in Indonesia with more than five years of active experience and documented project portfolios. Eight reputable construction firms were included in the study, each satisfying criteria related to company size, diversity of project types, operational track record, and willingness to participate. A purposive sampling method was employed to ensure that selected respondents, including directors, managers, and project supervisors, possessed the strategic and operational knowledge necessary to provide informed responses regarding organizational culture, risk management practices, intellectual capital, and performance outcomes. The sample size of 281 respondents was determined using Slovin's formula, ensuring statistical adequacy for multivariate analysis. All data were collected through a structured, self-administered questionnaire developed from validated instruments adapted to the Indonesian construction context. The organizational culture scale was adapted from [Odor \(2018\)](#) and [Attar et al. \(2018\)](#), the risk management scale from [Songling et al. \(2018\)](#) and [Liu \(2019\)](#), the intellectual capital scale from [Komnenić and Pulić \(2021\)](#) and the company performance scale from [Daniali et al. \(2020\)](#) and [Irmalasari et al. \(2022\)](#). All items employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Secondary data from annual reports and industry databases supplemented primary data to strengthen construct validity.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0. PLS-SEM was chosen over covariance-based SEM due to its robustness with non-normal data distributions, its suitability for exploratory structural models with both reflective and formative constructs, and its ability to simultaneously assess measurement model quality and structural path significance ([Hair et al., 2021](#)). The analysis followed a two-stage sequential process. In the first stage, the measurement model (outer model) was evaluated for indicator reliability (factor loadings  $> 0.70$ ), internal consistency reliability (Cronbach's alpha and composite reliability  $> 0.70$ ), convergent validity (AVE  $> 0.50$ ), and discriminant validity using both the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio (Fornell & Larcker, 1981). In the second stage, the structural model (inner model) was assessed by examining path coefficients, coefficient of determination ( $R^2$ ), predictive relevance ( $Q^2$ ), and the statistical significance of direct and indirect effects through bootstrapping with 5,000 resamples. Mediation was assessed following Baron and Kenny's criteria, supplemented by bootstrapped confidence intervals for indirect effects. Ethical principles of voluntary participation, informed consent, and data confidentiality were strictly observed throughout the research process.

## 4. Results and Discussions

### 4.1 Results

The analysis commenced with an evaluation of respondent demographics, followed by assessment of the measurement model and subsequently the structural model. The sample of 281 respondents reflected the male-dominated nature of the Indonesian construction industry, with 82.2% male respondents and 17.8% female. The majority of respondents were aged between 31 and 40 years (59.0%), indicating a sample composed predominantly of experienced working professionals. In terms of educational background, 78.0% held bachelor's degrees and 22.0% master's degrees, reflecting a well-educated sample. A large proportion (66.2%) had more than five years of work experience,

ensuring that respondents possessed sufficient institutional knowledge to provide meaningful and accurate assessments. Regarding position, 45.2% held leadership or supervisory roles, 37.8% were staff-level employees, and 17.0% were managers, providing balanced representation across organizational levels and perspectives.

The results of the reflective measurement model assessment, including outer loadings, Cronbach's alpha, composite reliability, and AVE for all four constructs. All indicator loadings exceeded the recommended 0.70 threshold, with organizational culture items ranging from 0.722 to 0.933, risk management items from 0.800 to 0.936, intellectual capital items from 0.896 to 0.937, and company performance items from 0.901 to 0.939. Cronbach's alpha values ranged from 0.966 to 0.981, far exceeding the 0.70 threshold, and composite reliability values ranged from 0.962 to 0.983, confirming excellent internal consistency across all constructs. AVE values of 0.707, 0.853, 0.834, and 0.889 for organizational culture, risk management, intellectual capital, and company performance, respectively, all surpassed the 0.50 threshold, confirming strong convergent validity (Hair et al., 2021).

Discriminant validity was confirmed using the Fornell-Larcker criterion, whereby the square root of each construct's AVE (IC = 0.913; OC = 0.840; CP = 0.850; RM = 0.895) exceeded all inter-construct correlations. Additionally, HTMT ratios for all construct pairs remained below the conservative 0.90 threshold, with the highest value being 0.879 between company performance and risk management. These results collectively confirm that all constructs were empirically distinct and that the measurement model demonstrated strong psychometric properties suitable for structural analysis.

Table 1. Structural model results: Direct and indirect path coefficients

Hypothesis / Path	Beta ( $\beta$ )	p-value	Decision	R <sup>2</sup>	Effect Type
<i>H</i> <sub>1</sub> : Organizational Culture → Intellectual Capital	0.620	0.000***	Supported	0.67 (IC)	Direct
<i>H</i> <sub>2</sub> : Risk Management → Intellectual Capital	0.229	0.039**	Supported		Direct
<i>H</i> <sub>3</sub> : Organizational Culture → Company Performance	-0.216	0.073	Not Supported		Direct
<i>H</i> <sub>4</sub> : Risk Management → Company Performance	0.261	0.049**	Supported		Direct
<i>H</i> <sub>5</sub> : Intellectual Capital → Company Performance	0.911	0.000***	Supported	0.71 (CP)	Direct
Indirect Effects (Mediation)					
<i>H</i> <sub>6</sub> : Org. Culture → Intell. Capital → Company Performance	0.565	0.000***	Supported		Indirect
<i>H</i> <sub>7</sub> : Risk Management → Intell. Capital → Company Performance	0.209	0.040**	Supported		Indirect

Table 1 presents the structural model results for both direct and indirect (mediation) hypotheses, estimated through 5,000-resample bootstrapping. The coefficient of determination (*R*<sub>2</sub>) for intellectual capital was 0.67, indicating that organizational culture and risk management collectively explained 67% of IC variance, representing a substantial effect. The *R*<sub>2</sub> for company performance was 0.71, demonstrating that the model explained 71% of performance variance. All direct path coefficients for *H*<sub>1</sub>, *H*<sub>2</sub>, *H*<sub>4</sub>, and *H*<sub>5</sub> were statistically significant, while *H*<sub>3</sub> (direct effect of organizational culture on company performance) was not supported (beta = -0.216, *p* = 0.073). The mediation paths *H*<sub>6</sub> and *H*<sub>7</sub> were both significant, confirming that intellectual capital plays a critical mediating role.

#### 4.2 Discussion

The finding that organizational culture exerts a highly significant positive influence on intellectual capital (*H*<sub>1</sub>, beta = 0.620, *p* < 0.001) is consistent with the theoretical position that a collaborative, knowledge-sharing culture is the primary incubator of organizational intellectual assets (Attar et al.,

[2018](#); [Gultom & Lubis, 2023](#)). Within the Indonesian construction context, firms that cultivated open communication channels, encouraged continuous professional development, and rewarded knowledge transfer across project teams demonstrated stronger capacity to develop human capital expertise, codify project learnings into structural capital, and build trust-based relational networks with clients and subcontractors. This aligns with findings from [Osman et al. \(2023\)](#), who showed that construction firms with innovation-oriented cultures achieved superior IC levels, and with [Nurmiati et al. \(2022\)](#), who demonstrated the role of total quality management cultures in enhancing performance through knowledge accumulation. The strength of this path coefficient (0.620) confirms that cultural transformation is the most powerful organizational lever for intellectual capital development in Indonesian construction companies.

Risk management's significant positive effect on intellectual capital ( $H_2$ , beta = 0.229, p = 0.039), while moderate, reflects an important mechanism through which protective and enabling organizational practices contribute to intangible asset development. When construction firms implement structured risk identification and mitigation processes, they simultaneously create repositories of risk knowledge that constitute valuable structural capital, develop personnel expertise in risk assessment that represents human capital, and build reputations for project reliability that strengthen relational capital with clients and financiers ([Bulatetskaya, 2019](#); [Wijaya & Mulyantini, 2023](#)). [Song et al. \(2025\)](#) similarly found that risk management practices enhanced stakeholder relationships and project outcomes through knowledge-building mechanisms, consistent with this study's finding. The relatively smaller coefficient compared to  $H_1$  suggests that while risk management contributes to IC development, its effect is more specialized and context-dependent than the pervasive influence of organizational culture.

The non-significant direct effect of organizational culture on company performance ( $H_3$ , beta = -0.216, p = 0.073) is a particularly noteworthy finding that challenges the widespread assumption in management literature that culture drives performance directly. This result suggests that in the Indonesian construction sector, the effect of organizational culture on performance is fundamentally mediated, transmitted through intellectual capital accumulation rather than operating as a direct performance driver. This interpretation is strongly supported by the highly significant mediation path  $H_6$  (beta = 0.565, p < 0.001), which demonstrates that intellectual capital carries the vast majority of the culture-to-performance effect. This finding aligns with [Reza and Silalahi \(2021\)](#), who demonstrated that intellectual capital was the critical mechanism through which organizational culture influenced firm performance in Indonesian service firms, and with [Sustrastanti and Rachmawati \(2023\)](#), who confirmed a similar pattern for green organizational culture and sustainability performance.

Risk management's significant direct positive effect on company performance ( $H_4$ , beta = 0.261, p = 0.049) confirms that beyond its indirect influence through intellectual capital, effective risk management directly contributes to performance outcomes by preventing value destruction through project failures, financial losses, and reputational damage ([Purwanti & Heriana, 2024](#); [Alshehhi et al., 2021](#)). The additional significant indirect effect through intellectual capital ( $H_7$ , beta = 0.209, p = 0.040) indicates partial mediation, whereby risk management improves performance both directly, by controlling adverse events, and indirectly, by building the organizational knowledge and capability base represented by intellectual capital. This dual mechanism underscores the strategic importance of enterprise risk management in Indonesian construction firms that aspire to both protect and grow their performance potential.

The most powerful finding of this study is the extremely strong positive effect of intellectual capital on company performance ( $H_5$ , beta = 0.911, p < 0.001), which represents not only the strongest path coefficient in the model but also one of the strongest IC-performance relationships reported in the construction management literature. This finding powerfully validates the resource-based view argument that intangible knowledge assets are the primary source of sustained competitive advantage in knowledge-intensive industries ([Khan, 2018](#)). In the Indonesian construction context, firms with

superior human capital in engineering design, structural capital in project management systems, and relational capital in client and government stakeholder networks were demonstrably better positioned to win high-value projects, deliver within constraints, and achieve superior financial outcomes. This is consistent with [Duodu and Rowlinson \(2021\)](#) and [Sucena et al. \(2024\)](#), who confirmed the IC-performance nexus in construction contracting contexts, and with [Gunawan and Widodo \(2022\)](#), who demonstrated that Indonesian construction firms with robust IC management practices consistently outperformed industry peers.

## **5. Conclusions**

### **5.1 Conclusion**

This study confirms that intellectual capital functions as the critical mediating mechanism through which organizational culture and risk management translate into measurable company performance improvements in Indonesian construction firms. While organizational culture's direct effect on performance was not significant in isolation, its powerful influence on intellectual capital development (beta = 0.620) and the subsequent strong IC-performance relationship (beta = 0.911) demonstrate that cultural investment is the most strategically consequential lever available to construction firm leadership. Risk management contributes to performance both directly and through IC accumulation, underscoring its dual role as a value protector and knowledge builder. The integrated model explains 71% of the variance in company performance, providing strong empirical support for the theoretical framework. These findings recommend that Indonesian construction companies prioritize fostering knowledge-sharing cultures, institutionalizing comprehensive risk management frameworks, and actively investing in intellectual capital development as interdependent strategic imperatives rather than isolated management initiatives.

### **5.2 Research Limitations**

This study is subject to several methodological limitations. First, the cross-sectional research design precludes causal interpretation of the relationships identified, as all data were collected at a single point in time. Longitudinal studies would be necessary to establish directional causality and track how organizational culture and risk management investments translate into IC growth and performance improvements over time. Second, the sample was drawn from eight purposively selected construction firms in Indonesia, which may not be representative of the full spectrum of the country's construction industry, particularly smaller firms and regional contractors. Third, self-reported questionnaire data are susceptible to social desirability bias and common method variance, potentially inflating correlations between constructs. Fourth, financial performance data were not integrated from secondary sources, relying solely on perceptual measures of company performance, which may not fully capture objective financial outcomes. Fifth, the study did not differentiate between the three sub-components of intellectual capital (human, structural, and relational capital), limiting insight into which specific IC dimension most strongly drives performance.

### **5.3 Directions and Future Study**

Future research should extend this integrated framework through longitudinal panel designs that can track changes in organizational culture, risk management maturity, and intellectual capital across multiple time periods, enabling stronger causal inference. Multi-sector comparative studies that examine whether the IC mediating mechanism observed in this construction context generalizes to other capital-intensive industries such as manufacturing, mining, or infrastructure would enrich theoretical generalizability. Future scholars should consider disaggregating intellectual capital into its three constituent components to identify which dimensions of IC most powerfully mediate the relationships studied here. Additionally, the incorporation of objective financial performance metrics from publicly available annual reports alongside perceptual survey measures would strengthen construct validity. Research examining the moderating roles of firm size, ownership structure (state-owned versus private), and regional regulatory environment in the organizational culture-IC-performance model would generate actionable, context-specific insights for Indonesian construction industry policymakers and firm leaders. Finally, future studies could explore how digital transformation, Building Information Modeling (BIM) adoption, and ESG compliance initiatives

interact with intellectual capital to shape construction firm performance in the post-pandemic Indonesian market.

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### Author Contributions

RH contributed to conceptualization, data collection, formal analysis, writing of the original draft, and visualization. WA contributed to supervision, methodology design, validation, and critical review of the manuscript. JT contributed to literature review, data curation, writing review and editing, and project administration. All authors have read and approved the final version of the manuscript.

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