

The Influence Of Intellectual Capital On The Performance Of Small And Medium Enterprises In North Sumatera Province

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ARTICLE INFO

Article history:

Received : 3 July 2025

Accepted : 21 July 2025

Available : 28 July 2025

Keywords:

Intellectual Capital, Human Capital, Structural Capital, Relational Capital, MSME Performance.

ABSTRACT

This research investigates how Intellectual Capital—comprising Human Capital, Structural Capital, and Relational Capital—affects the performance of Micro, Small, and Medium Enterprises (MSMEs) in North Sumatra. This study adopts a quantitative research approach to investigate the relationship between intellectual capital and the performance of Micro, Small, and Medium Enterprises (MSMEs) in North Sumatra Province. The primary data used in this research were collected through structured questionnaires distributed online using Google Forms. The questionnaire links were shared via email and social media platforms, particularly WhatsApp, to facilitate broader participation among MSME actors across the region. Using a quantitative methodology and data collected via online questionnaires, the study applied Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS software for analysis. The findings indicate that both Human and Relational Capital have significant positive influences on MSME performance, whereas Structural Capital does not demonstrate a measurable impact. These insights suggest that developing human resource capabilities and external business relationships is crucial to enhancing MSME outcomes in the region. This study finds that the components of intellectual capital exert varying degrees of influence on the performance of MSMEs in North Sumatra. Human capital demonstrates a clear and statistically significant positive impact, suggesting that enhancing workforce capabilities—such as expertise, competencies, and practical knowledge—can substantially elevate business outcomes. In contrast, structural capital does not exhibit a notable influence, indicating that current organizational frameworks, internal systems, and operational procedures may not yet be effectively leveraged to boost performance. On the other hand, relational capital shows a significant and positive effect, highlighting the importance of robust external networks with customers, suppliers, and partners in supporting business growth. These insights suggest that prioritizing the development of both human and relational

capital is essential for advancing the performance and sustainability of MSMEs in the region.



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1. INTRODUCTION

The COVID-19 pandemic had a considerable adverse impact on MSMEs across Indonesia. According to the Ministry of Cooperatives and SMEs (Depkop.go.id), approximately 37,000 MSMEs reported operational challenges, with 56% experiencing a downturn in revenue, 22% facing funding issues, 15% encountering distribution disruptions, and 4% struggling to procure raw materials. Social restrictions further exacerbated the crisis, leading to a steep performance decline among MSMEs. Between 2017 and 2019, the number of MSMEs increased steadily, but a sharp decline followed in 2020 due to the pandemic. Recovery began in 2021. Despite employing more than 80% of the workforce in North Sumatra, MSMEs contribute only 46.51% to the region's GDP (Antara News Sumut, 2023), highlighting a mismatch between their strategic importance and economic output. Past research (Bontis et al., 2011; Cabrita & Vaz, 2006) affirms that Intellectual Capital significantly affects organizational performance. However, empirical data specific to North Sumatra MSMEs remains limited. This study fills that gap by assessing Intellectual Capital's influence using the Balanced Scorecard approach to gauge organizational success comprehensively.



Figure 1. Number of MSMEs in Indonesia from 2017 to 2021

Source: Secondary data processed, 2025

According to research by Bontis et al. (2011) using path analysis, the three components of intellectual capital (human capital, structural capital, customer capital) together have a positive and substantive effect on business performance in the pharmaceutical sector. This is consistent with the research

by Cabrita and Vaz (2006), which demonstrated that intellectual capital (IC) has a substantive and significant impact on the performance of the Portuguese banking industry.

The performance measurement of MSMEs that are the object of this study, the strategies chosen by MSMEs in business competition, and the performance measures used by MSMEs, as well as how to propose performance measures for assessing strategy implementation for MSMEs, will be the object of this study with reference to the Balanced Scorecard method. This will be reviewed and improved in this study to obtain the best method for measuring organisational performance, in this case MSMEs.

2. LITERATURE REVIEW

1. Intellectual Capital

Intellectual capital refers to intangible assets related to knowledge, skills, innovation, and organizational relationships that contribute to value creation and sustainable competitive advantage. Intellectual Capital encompasses intangible resources such as expertise, innovation, systems, and stakeholder relationships. Pulic (2000) categorizes it into:

1. Human Capital: Employee knowledge, creativity, and skills.
2. Structural Capital: Organizational infrastructure like systems and databases.
3. Relational Capital: External stakeholder relationships.

Effective intellectual asset management is linked to superior innovation, strategic flexibility, and performance outcomes (Bontis, 1998).

2. MSME Performance

MSME performance can be evaluated through financial (e.g., profit margins, ROI) and non-financial metrics (e.g., customer satisfaction, innovation capacity). Kaplan and Norton (1996) advocate using the Balanced Scorecard for multidimensional performance assessment. In Indonesia, MSMEs frequently struggle with capital, technology, and talent access, making intellectual capital a critical factor (Suharti & Ghazali, 2013). In the Indonesian context, MSMEs play a pivotal role in supporting regional economic development. However, many MSMEs face constraints related to limited access to capital, technology, and skilled labor. The ability to leverage intellectual capital is therefore seen as a strategic solution to overcome such limitations (Suharti & Ghazali, 2013).

3. Relationship Between Intellectual Capital and MSME Performance

Numerous studies affirm the connection between intellectual capital and business success. For instance, Kamath (2008) found a strong link between human capital and SME profitability in India. Widyaningrum and Astuti (2016) emphasized the value of relational capital for customer loyalty among Indonesian MSMEs. However, structural capital outcomes remain inconclusive, especially in contexts with limited organizational formalization (Raharjo et al., 2020).

3. METHODS

This study employed a quantitative research design using primary data obtained via Google Form questionnaires. Links were distributed through email and WhatsApp. SmartPLS software facilitated PLS-SEM analysis to examine relationships among variables. The research population includes MSME owners and managers operating in North Sumatra. A purposive sampling technique was employed to select respondents who met specific criteria relevant to the study objectives. A total of 384 valid responses were obtained and analyzed.

To examine the hypothesized relationships among the variables, the study utilizes Partial Least Squares Structural Equation Modeling (PLS-SEM). This method is appropriate for testing complex models and is particularly effective when the research focuses on prediction and theory development. The data were processed using the SmartPLS software (version 3.0), which enabled the evaluation of measurement models (validity and reliability) and structural models (path coefficients and significance).

The independent variables in this study are the three components of intellectual capital: human capital, structural capital, and relational capital. The dependent variable is MSME performance, measured through both financial and non-financial indicators. All constructs were operationalized based on validated instruments from previous literature, adapted to suit the MSME context in Indonesia.

3. RESULTS AND DISCUSSION

The characteristics of respondents in this study include two main aspects, namely gender and length of business operation. This information is important to understand the general profile of MSME players participating in the study, as well as to see the demographic distribution that may influence the interpretation of the analysis results.

Table 1. Respondent Characteristics

Gender	Number	Percentage
Male	141	36,72
Female	243	63,28
Length of Business	Number	Percentage
3-5 Tahun	157	40,89
6-10 Tahun	148	38,54
11-20 Tahun	62	16,15
Lebih dari 20 Tahun	17	4,43
Total	384	100,00

Source: Secondary data processed, 2025

Table 1 presents an overview of the demographic characteristics of the respondents, focusing on gender distribution and length of business operation. Gender Distribution : Out of a total of 384 respondents, 243 (63.28%) were female, while 141 (36.72%) were male. This gender composition reveals that women constitute the majority of MSME actors involved in this study. The high percentage of female participants suggests that women play a prominent role in the MSME sector in North Sumatra. This trend may reflect the growing involvement of women in entrepreneurship and their increasing contribution to regional economic development.

Business Tenure : Regarding the length of time the businesses have been operating, the largest proportion of respondents (157 businesses or 40.89%) have been in operation for 3–5 years. This is followed by 148 businesses (38.54%) that have been running for 6–10 years, indicating that most MSMEs in this sample are in the early to mid-growth stages of development. Additionally, 62 businesses (16.15%) have operated for 11–20 years, representing a more established group, while only 17 businesses (4.43%) have been in operation for over 20 years. These findings indicate that the majority of MSMEs in the region are relatively young enterprises, still in the growth or consolidation phase. This variation in business maturity offers valuable insights into how experience levels might influence the effectiveness of intellectual capital components in enhancing performance. Younger businesses may prioritize agility and innovation, whereas older firms might focus more on institutionalizing systems and relationships.

1. Human Capital

The findings of this study affirm that human capital has a statistically significant and positive impact on the performance of MSMEs in North Sumatra. This highlights the critical role of individual competencies—such as skills, knowledge, experience, and innovation—in driving business outcomes. Human capital is considered the most dynamic and strategic resource, as it directly influences decision-making, problem-solving, and adaptability to

market changes. Highly capable entrepreneurs and employees are better positioned to optimize operational efficiency, enhance product or service quality, and respond swiftly to external challenges. The results align with Roos et al. (1997), who argue that the intellectual capacity embedded in individuals is a primary determinant of organizational success. In the MSME context, where formal structures may be limited, reliance on human expertise becomes even more pivotal. Thus, investing in continuous training, leadership development, and knowledge-sharing mechanisms is essential for sustaining competitive performance in the long term.

2. Structural Capital

In contrast, the analysis reveals that structural capital does not exhibit a significant influence on MSME performance in the region. This outcome suggests that internal organizational systems, processes, databases, and routines may not yet be fully developed or effectively utilized to support operational excellence. Structural capital is theoretically essential, as it provides the infrastructure that enables human capital to perform consistently. However, its impact is often contingent upon the maturity and formality of organizational processes. Previous studies (e.g., Yaseen et al., 2016; Smriti & Das, 2018) have emphasized the value of structural capital in enhancing efficiency and scalability. Nonetheless, in many MSMEs—especially in emerging economies—structural elements such as standard operating procedures, documentation, and technological systems may still be underdeveloped or inconsistently implemented. The insignificant effect observed in this study may reflect a gap between the theoretical potential of structural capital and its practical application in small-scale enterprises. Therefore, MSMEs are encouraged to strengthen internal infrastructure, formalize business processes, and adopt information systems to fully leverage the benefits of structural capital.

3. Relational Capital

Relational capital is found to have a significant and positive effect on MSME performance, underscoring the importance of external relationships in the success of small businesses. This dimension of intellectual capital encompasses networks with customers, suppliers, government institutions, and other strategic partners. Strong relational capital facilitates trust, loyalty, and information exchange, which are essential for market access, resource acquisition, and innovation. As highlighted by Starovic and Marr (2003), relational capital includes various components such as brand reputation, customer satisfaction, negotiation capacity, and distribution channels. In the context of MSMEs with limited internal resources, leveraging external relationships becomes a key strategy to enhance competitiveness. Positive

customer relations can lead to repeat business and constructive feedback, while strong supplier partnerships can ensure stable input availability and pricing. The findings suggest that cultivating and managing these relationships is not merely supportive but foundational to sustainable business performance in dynamic market environments.

4. CONCLUSION

This study provides empirical evidence on the varying influence of intellectual capital components—human capital, structural capital, and relational capital—on the performance of Micro, Small, and Medium Enterprises (MSMEs) in North Sumatra Province. The analysis confirms that human capital plays a critical role in enhancing business performance, demonstrating that the development of employee competencies, expertise, and adaptability significantly contributes to operational success. In contrast, structural capital does not show a statistically significant impact on MSME performance, suggesting that internal systems, procedures, and organizational infrastructure are either underutilized or not sufficiently formalized within the MSME sector. This finding indicates a need for strategic investments in business processes and internal capabilities to better support growth and sustainability. Meanwhile, relational capital emerges as a vital factor in improving performance outcomes. The ability of MSMEs to build and maintain strong external relationships with customers, suppliers, and stakeholders serves as a competitive advantage in dynamic business environments. Taken together, the results suggest that MSMEs in North Sumatra should prioritize strengthening both human and relational capital as key drivers of growth and resilience. Policy makers and business development programs should align their support mechanisms accordingly to empower MSMEs in leveraging their intellectual resources for long-term performance enhancement.

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