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STRENGTHENING MSMES PERFORMANCE THROUGH INTELLECTUAL AND RELATIONAL CAPITAL: THE MODERATING ROLE OF INNOVATION CAPABILITIES

[1]Putri Kemala Dewi Lubis, [2]Iskandar Muda, [3]Erlina, [4]Khaira Amalis Fachrudin

[1,2,3]Departement of Accounting, Universitas Sumatera Utara, Faculty of Economics and Business, Medan, Indonesia
[4]Departement of Management, Universitas Sumatera Utara, Faculty of Economics and Business, Medan, Indonesia

putikemala@students.usu.ac.id[1]
iskandar1@usu.ac.id[2]
erlina@usu.ac.id[3]
khaira@usu.ac.id[4]

Abstract
This study examines the impact of Intellectual Capital (IC), Relational Capital (RC), and Innovation Capability (INC) on the performance of Micro, Small, and Medium Enterprises (MSMEs), while also testing the moderating role of Innovation Capability. Using Partial Least Squares Structural Equation Modeling (PLS-SEM), the findings reveal that both IC and RC positively and significantly influence MSME performance. Intellectual Capital is identified as the most dominant factor, demonstrating that knowledge, skills, and organizational systems play a critical role in enhancing business efficiency and productivity. Relational Capital also contributes to performance by leveraging networks with customers, partners, and institutions as strategic resources. Furthermore, Innovation Capability emerges as a direct predictor of performance, underscoring its importance in building adaptability and competitiveness. However, its moderating effect on the relationship between IC, RC, and performance is not significant. These results provide strong empirical evidence for MSMEs to prioritize the management of intellectual and relational capital while strengthening innovation capability to achieve sustainable growth.

Keywords Intellectual Capital; Relational Capital; Innovation Capability; MSME Performance; PLS-SEM

1 Introduction

A Micro, Small, and Medium Enterprises (MSMEs) are very important contributors to the stages of economic development in both developed and developing countries such as Indonesia. MSMEs are an important element in the structure of the national economy. In Indonesia, MSMEs cover more than 99% of the total business actors and absorb more than 97% of the workforce, and make a significant contribution to the Gross Domestic Product (GDP), which is 61.07% or IDR 8,573.89 trillions (Kemenkop UKM, 2021).
Data released by the Ministry of Cooperatives and Small and Medium Enterprises (Kemenkop UMKM) throughout 2022, UMKM in the country was recorded to have

grown very well, the figure has reached 8.71 million units. When viewed by Province, West Java still ranks first for the most UMKM with a total of 1.49 million business units. Meanwhile, the region with the fewest is Papua with a total of 3.9 thousand units. Here is the complete data on UMKM by province :

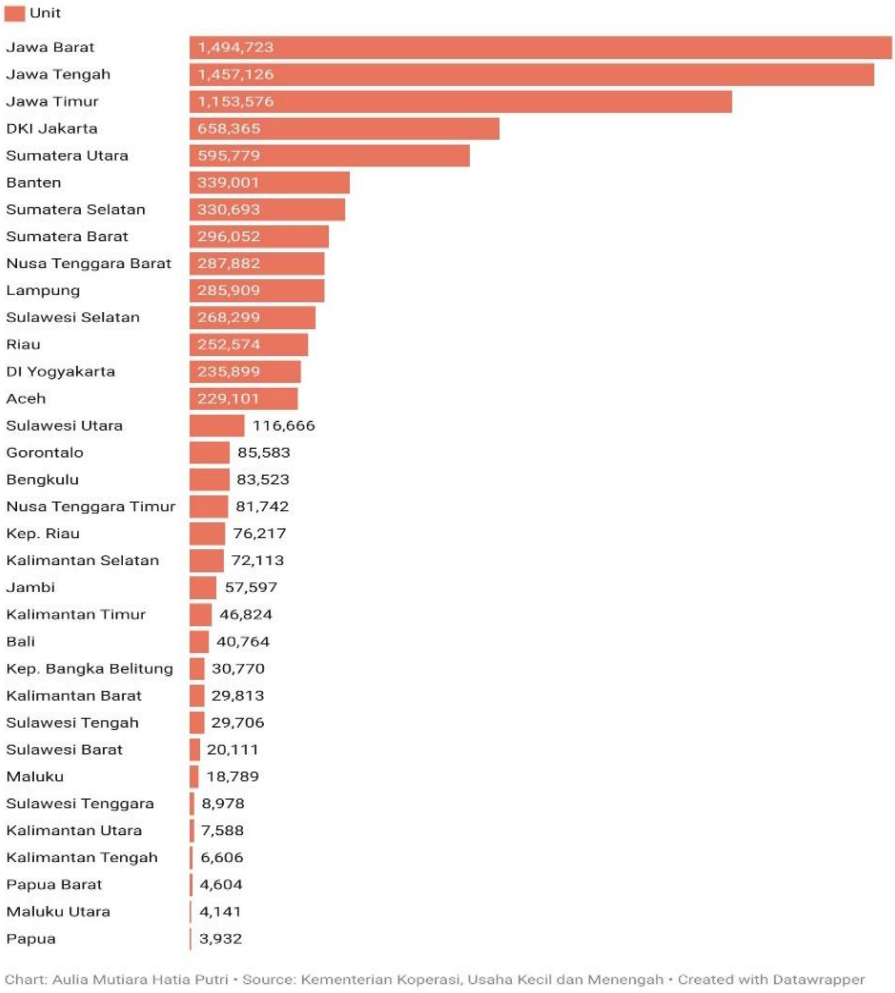

Figure 1. Number of MSMEs in Indonesia in 2022

The existence of MSMEs is key to poverty alleviation, job creation, and economic equality in the regions. Based on data from the Central Statistics Agency (BPS), the growth rate of micro, small, and medium enterprises since 2017-2020 shows that the development of micro, small, and medium enterprises, the number of MSMEs units in North Sumatra province has increased along with the number of workers and the added value they provide to the economy. Job opportunities in the MSMEs sector are expanding along with the increasing number of MSME units.

Table 1. Growth of MSMEs in North Sumatra

SMALL					
	2016	2017	2018	2019	2020
Number of companies according to province (Unit Amount Power)	4043	6750	7387	4628	6668
Amount power Work according	27103	51322	54335	43171	51535

to province (Person)					
Mark plus (Price Market) according to province (Million Rupiah)	1262854	2157166	2111035	1578031	2052685
MICRO					
	2016	2017	2018	2019	2020
Number of companies according to province (Unit Amount Power)	94979	145716	133221	122524	113495
Amount power Work according to province (Person)	168272	273642	238152	217916	200851
Mark plus (Price Market) according to province (Million Rupiah)	3436636	5895725	5844179	4832137	4188157

Source : Central Statistics Agency (BPS) data

However, amidst its strategic role, MSMEs face major challenges in maintaining and improving their performance. Optimizing the performance of MSMEs, especially in North Sumatra, is still hampered by several influencing factors. Rapid changes in market dynamics, globalization, and technology penetration require MSMEs to continue to adapt and improve their innovation capacity.

In the framework of a knowledge -based economy, competitive advantage no longer relies solely on physical resources, but rather on Intellectual Capital (IC), which is an intangible asset that includes human capital, structural capital, and relational capital (Bontis, 1998 ; Stewart & Ruckdeschel, 1998). Human capital refers to the competence, skills, and creativity of human resources. Structural capital includes systems, procedures, technology, and organizational culture. While relational capital relates to external networks such as customers, partners, suppliers, and other supporting institutions.(Yli-Renko et al., 2001)

The relationship between Intellectual Capital and company performance is strengthened by Innovation Capability (Aljuboori et al., 2021). Relational capital, for example, helps MSMEs gain access to market information, quality raw materials, and financial and institutional support (Agostini et al., 2017). However, the great potential of Intellectual Capital (IC) and Relational Capital (RC) does not necessarily produce optimal performance if MSMEs do not have adequate Innovation Capability (INC) to integrate and realize the value of these capitals (Subramaniam & Youndt, 2005 ; Wang & Chen, 2013).

Innovation Capability is defined as the ability of an organization to create, absorb, and implement new ideas in products, processes, or business models (Maldonado-Guzmán et al., 2019). In the context of MSMEs, this capability is key in dealing with market uncertainty and technological change (Sulistyo & Siyamtinah, 2016). Unfortunately, many MSMEs in Indonesia, especially in North Sumatra, are still weak in this aspect. They tend to be stagnant in innovation, less adaptive, and have not been able to utilize technology optimally.

In such a situation, Innovation Capability is believed to be able to act as a moderator variable (Aziz, 2023) that strengthens or weakens the relationship between Intellectual Capital (IC) and Relational Capital (RC) on MSME Performance. In other words, the influence of Innovation Capability and Relational Capital on performance will be much greater if MSMEs have a high level of innovation capability (Cosentino & Principale,

2024). This perspective is in line with the Dynamic Capabilities View (DCV), which states that sustainable competitive advantage can only be achieved if the organization has the ability to dynamically rearrange its resources according to environmental changes (Teece et al., 1997).
This study aims to examine the influence of Intellectual Capital (IC) and Relational Capital on MSME performance, with Innovation Capability as a moderating variable. This model is expected to provide theoretical contributions in enriching the literature that combines Knowledge-Based View (KBV) and Dynamic Capabilities View (DCV), as well as practical contributions for MSME actors and policy makers in designing strategies to increase competitiveness based on innovation and knowledge.

2 Literature overview

2.1. Theoretical Basis

This study uses two main theoretical approaches, namely Knowledge-Based View (KBV) and Dynamic Capabilities View (DCV). Knowledge-Based View (KBV) (Grant, 1996) emphasizes that knowledge is the main strategic resource of the company, and organizations that are able to manage knowledge through intangible assets such as intellectual capital will gain sustainable competitive advantage (Beltramino et al., 2020). On the other hand, DCV emphasizes the importance of organizational capabilities to respond to change through innovation processes and strategic transformation (Kumar & Shukla, 2019). Theoretically, DC is known that dynamic capacity emphasizes the company's ability to react and respond quickly and adequately to any sudden changes in the external environment (Mushangai, 2023)
In the context of MSMEs, which tend to have limited resources, intellectual capital management and external relationships are important determinants of business continuity. The ability to create, utilize, and realize knowledge into innovation is also very important to maintain competitiveness.

2.2. The Influence of Intellectual Capital on MSME Performance

Intellectual Capital (IC) is an intangible asset that includes knowledge, experience, and information that companies use to create value (Bontis, 1998; Brooking, 1996). IC is usually divided into three components: human capital, structural capital, and physical (relational) capital (Chen et al., 2005; Dias et al., 2013). In this study, Intellectual Capital (IC) is focused on two main components, namely. Human capital includes competence, creativity, education, experience, and motivation of human resources (Bontis, 1998; García-Meca, 2005; Roos & Roos, 1997). Structural capital includes systems, processes, organizational culture, and technology that enable companies to manage knowledge and improve efficiency (Beltramino et al., 2020; Gogan et al., 2015). Good structural capital functions as an operational supporter and driver of innovation.
Intellectual Capital (IC) is believed to have a significant influence on company performance, especially in creating efficiency and competitive advantage through structured and measurable knowledge management. That competent employees and structured systems create efficiency and innovation that impact business performance. (Aljuboori et al., 2021; Leny & Nurul, 2023; Mulyati et al., 2021)

H1: Intellectual Capital has a positive effect on MSME Performance

2.3. The Influence of Relational Capital on MSME Performance

Relational Capital (RC) refers to the quality of a company's external relationships with customers, suppliers, business partners, government, and communities (Sulistyo & Siyamtinah, 2016). Strong relationships can create customer loyalty, expand distribution networks, and enhance market legitimacy. According to (Cleary & Quinn, 2016), Relational Capital (RC) is a key component in building a company's competitive position. In the context of MSMEs, external relationships are very important because internal resource limitations can be compensated through effective external collaboration. Strong relationships can create customer loyalty, expand distribution networks, and enhance market legitimacy (AlQershi et al., 2020). Relational Capital (RC) not only includes a series of external relationships built by the company, but also other dimensions such as branding and reputation (Agostini et al., 2017). Relational Capital (RC) is a key component in building a company's competitive position (Cohen & Kaimenakis, 2007). In the context of MSMEs, external relationships are very important because internal resource limitations can be compensated through effective external collaboration. In this case, the value generated and preserved through good relationships, which are maintained, and developed is referred to as relational capital (YahiaMarzouk & Jin, 2022).

THAT EXTERNAL RELATIONS OWNED BY MSMES EXPAND MARKET ACCESS, IMPROVE REPUTATION, AND CREATE OPPORTUNITIES FOR STRATEGIC SYNERGY. (RIVERA ET AL., 2025)

H2: Relational Capital has a positive effect on MSME Performance

2.4. The Influence of Innovation Capability on MSME Performance

Innovation Capability (INC) is defined as the ability of an organization to create, absorb, and implement new ideas in products, processes, and business models (Osiyevskyy et al., 2025; Phuong et al., 2022). Innovation capability encompasses aspects of people, systems, and organizational culture that support creative activities and experimentation.

Several studies (Iddris, 2016; Prajogo & Ahmed, 2006) have shown that Innovation Capability (INC) acts as a link between intellectual capital and performance. This capability enables organizations to transform intangible resources into tangible advantages. That the higher the innovation capability possessed by MSMEs, the greater their ability to create added value, adapt to market changes, and produce superior business performance sustainably. (Grafton et al., 2010; Maldonado-Guzmán et al., 2019; Quintero Sepúlveda & Zúñiga Collazos, 2025; Saunila, 2016)

H3: Innovation Capability has a positive effect on MSME Performance

2.5. The Moderating Effect of Innovation Capability

The performance of MSMEs in this study includes financial and non-financial dimensions, such as profit growth, customer satisfaction, operational efficiency, and cost reduction (Kaplan & Norton, 1996; Susanti et al., n.d.). Performance is considered a representation of the success of a business in managing internal and external resources sustainably. According to (Ruli et al., 2021), sustainable performance reflects the ability of MSMEs to innovate, retain consumers, and generate long-term profits. In this study, ICap is positioned as a moderating variable, because it is assumed to strengthen the influence of Innovation Capability (INC) and Relational Capital (RC) on MSME performance. MSMEs that have high innovation capabilities tend to be more successful

in actualizing the potential of Innovation Capability (INC) and Relational Capital (RC) compared to those that do not. That MSMEs without innovation capabilities, knowledge and internal systems will not effectively produce high performance. That the ability to adopt external knowledge into a competitive advantage is determined by the innovative capabilities they have (Aziz, 2023).

H4: Innovation Capability moderates the relationship between Intellectual Capital and MSME Performance.
H5: Innovation Capability moderates the relationship between Relational Capital and MSME Performance.

The conceptual model describes the direct influence of Intellectual Capital (IC) and Relational Capital (RC) on MSMEs Performance, as well as the moderating effect of Innovation Capability on the relationship.

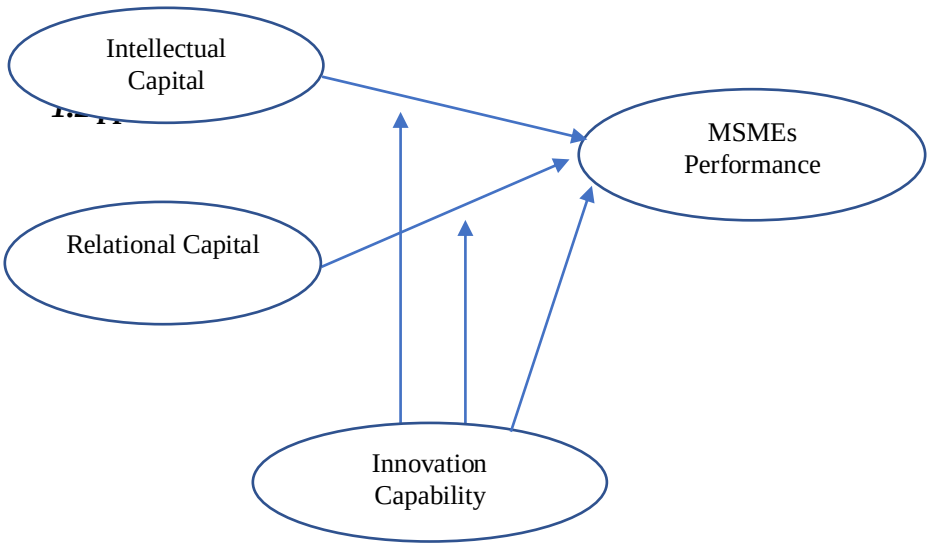

Figure 2. Conceptual Framework

3 Research Method

This study uses an explanatory quantitative approach with the aim of testing the direct influence and interaction between variables in the theoretical model. The focus of the study is to analyze the influence of Intellectual Capital (IC) and Relational Capital (RC) on MSME Performance, with Innovation Capability (INC) acting as a moderator variable as well as a direct independent variable on performance.
The data collected through the questionnaire will be analyzed using the Structural Equation Modeling (SEM) approach with the Partial Least Squares (PLS-SEM) method. This analysis was carried out using SmartPLS 3 software, because it is suitable for

complex models, has a latent moderation construct, and is able to handle non-normal data and medium to large sample sizes.(Hair et al., 2021)

The analysis was conducted through two main stages, Measurement Model Evaluation (Outer Model) and Structural Model Evaluation (Inner Model). The Outer Model stage includes Convergent validity test, using Average Variance Extracted (AVE) value ≥ 0.50; then construct reliability test, through Composite Reliability (CR) value ≥ 0.70; Cronbach's Alpha and rho_A ≥ 0.70, outer loading (loading factor) and multicollinearity test with VIF < 5. The Inner Model stage includes Goodness of fit analysis, path coefficient analysis to see the direct influence and interaction between variables; Path significance test through bootstrapping (5,000 resampling); Testing the R^2, Q^2, and f^2 effect size values as indicators of predictive power and model relevance. And the moderation analysis was conducted using two-way interaction (two-stage approach) to test the moderating role of Innovation Capability (INC) on the relationship between Intellectual Capital (IC) and Relational Capital (RC) with MSME Performance.

The data on the number of MSME population used in this study was obtained from the official Open Data portal of the North Sumatra Provincial Government, namely through the page https://sadaina.sumutprov.go.id. The data is a dataset of the number of MSMEs according to the classification of business scale (Micro Businesses, Small Businesses, and Medium Businesses) and the administrative area of districts/cities in North Sumatra Province in 2023. Based on this dataset, the total population of MSMEs recorded is 1,265,638 business units, spread across ten districts that are the focus of this study. This dataset is used as a basis for determining the number and distribution of samples, both based on region and business scale classification, using the Proportionate Stratified Random Sampling technique.

The Proportionate Stratified Random Sampling technique was used to ensure a balanced representation of the three categories of MSMEs, namely Micro Enterprises, Small Enterprises, and Medium Enterprises. From a total population of 1,265,638 business units, a sample size of 1,000 respondents was determined. The sample was divided proportionally based on the scale of the business, namely 694 micro enterprises (69.4%), 239 small enterprises (23.9%), and 67 mediums enterprises (6.7%). The selection of respondents from each stratum was carried out randomly to ensure that each type of business was represented equally in the analysis.

4 Result and Discussion

4.1. Respondent Characteristics

Based on data collected from 1,000 respondents of MSMEs actors, it was found that the duration of the business was quite diverse, ranging from businesses that had only been running for a few months to those that had been operating for more than two decades. Most respondents were in the young and growing business category, namely MSMEs that had been operating for between 1 and 10 years. This category covers more than 70% of the respondent population, indicating that MSMEs in the research area are still in the active growth and business expansion phase.

Meanwhile, around 12% of respondents are included in the new business category (established for less than 1 year), which are generally still in the market adaptation stage and building a basic organizational structure. On the other hand, there are also stable business groups (10–<20 years) and established businesses (≥ 20 years) which each cover around 13% and 5% of the total respondents. This group shows the characteristics

of MSMEs that have survived in the long term and are likely to have a stronger intellectual capital structure and relational network.
Overall, this distribution shows that most of the MSMEs respondents are at a strategic stage to be intervened through innovation capability improvement and intellectual capital strengthening programs, because they are still in the learning, system development, and market network expansion phases.

4.2. Measurement Model Testing (Outer Model)

The outer model testing aims to evaluate the quality of the instrument in measuring the latent construct used. The assessment is carried out through reliability testing, convergent validity,

4.2.1. Convergent Validity and Reliability

Table 2. Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
INC * IC	1,000	1,000	1,000	1,000
INC * IR	1,000	1,000	1,000	1,000
Innovation Capability (ICap)	0.970	0.970	0.972	0.701
Intellectual Capital (IC)	0.947	0.949	0.955	0.680
MSMEs Performance_(MP)	0.963	0.965	0.967	0.649
Relational Capital (IR)	0.906	0.906	0.934	0.780

The evaluation of construct reliability and validity was carried out through three main indicators, namely Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). The test results showed that all constructs met the criteria, exceeding the minimum threshold suggested by Hair et al. (2021), namely: Cronbach's Alpha and rho_A ≥ 0.70, Composite Reliability ≥ 0.70 and AVE ≥ 0.50.
The Cronbach's Alpha and rho_A values for all constructs ranged from 0.906 to 1.000, indicating a very good level of internal reliability. This means that the indicators in each construct show consistency in measuring the same concept.
All constructs also show high Composite Reliability, namely above 0.90, with the highest value in the Innovation Capability (INC) moderation construct. × Intellectual Capital (IC) and Innovation Capability (INC) × Relational Capital (RC) of 1,000, which reflects the absence of systematic measurement error.
The AVE values of all constructs are also above the minimum threshold of 0.50, with a range of 0.649 to 1.000, indicating that the constructs can explain more than 50% of the variance of their indicators on average. The highest AVE: Innovation Capability (INC) × Intellectual Capital (IC) & Innovation Capability (INC) × Relational Capital (RC) = 1.000 And the lowest AVE: MSME Performance = 0.649 and the main constructs such as Innovation Capability (INC) = 0.701 and Intellectual Capital = 0.680, indicating good convergent validity.

4.2.2. Outer Loadings

All indicators have outer loadings above 0.70, indicating that each indicator is able to explain its construct consistently

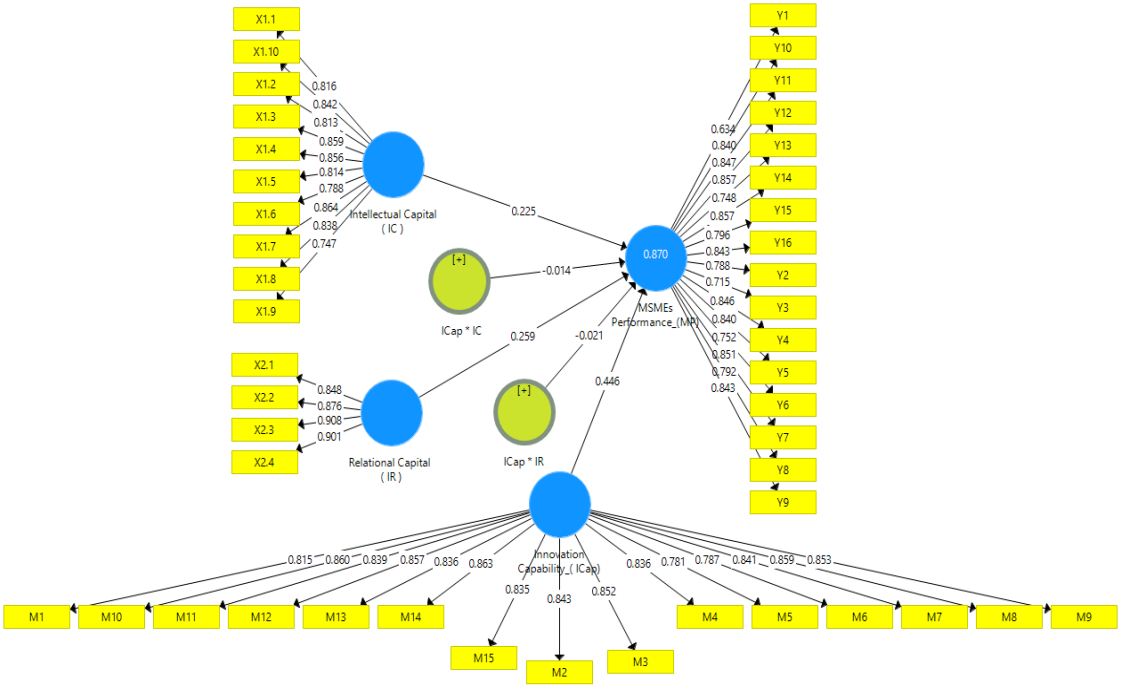

Figure 3. Outer Loading

Based on the results of the measurement model analysis (outer model), all indicators in the research construct show an outer loading value above 0.70, which means that it meets the requirements for convergent validity (Hair et al., 2021). This value indicates that each indicator has a strong contribution in explaining the latent construct it represents.

Intellectual Capital (IC) where the Intellectual Capital (IC) construct is measured by 10 indicators (X1.1 to X1.10), all of which have loading values between 0.747 and 0.864. This shows that indicators such as HR knowledge, internal work systems, and organizational routines strongly reflect the concept of intellectual capital in the context of MSMEs.

Relational Capital (IR), where four indicators (X2.1–X2.4) that measure relational capital show very high loading values, namely between 0.848 and 0.908, which indicates that the quality of external relationships such as partnerships and customer loyalty have very good measurement power.

Innovation Capability (INC), where 15 indicators (M1–M15) form the ICap construct, with loadings ranging from 0.781 to 0.863, reflecting that all dimensions of innovation (ideation, implementation, technology adaptation) are measured validly and reliably.

MSME performance (KU), measured using 16 indicators (Y1–Y16), with loading values ranging from 0.634 to 0.857. Although there is one indicator (Y1 = 0.634) slightly below the optimal standard (0.70), its value is still within the tolerance limit and does not need to be eliminated because the overall contribution of the construct remains strong.

4.2.3. Multicollinearity Test with VIF < 5

Table 3. Outer VIF Values

	VIF
Intellectual Capital (IC) * Innovation Capability (INC)	1,000
M1	3,034
M10	3,906
M11	3,345
M12	3,693
M13	3,244
M14	3,755
M15	3,280
M2	3,589
M3	3,421
M4	3,126
M5	2,441
M6	2,614
M7	3,384
M8	3,639
M9	3,543
Relational Capital (IR) * Innovation Capability (INC)	1,000
X1.1	2,855
X1.10	2,854
X1.2	2,778
X1.3	3,404
X1.4	3,391
X1.5	2,592
X1.6	2,307
X1.7	3,282
X1.8	2,911
X1.9	2,060
X2.1	2,192
X2.2	2,524
X2.3	3,555
X2.4	3,321
Y1	1,846
Y10	3,438
Y11	3,620
Y12	3,734
Y13	2,260
Y14	3,597
Y15	2,691
Y16	3,116
Y2	2,647
Y3	2,063
Y4	3,860

	VIF
Y5	3,766
Y6	2,248
Y7	3,463
Y8	2,491
Y9	3,647

The multicollinearity test aims to ensure that the indicators in the construct do not experience high redundancy with each other. In PLS-SEM, the recommended VIF (Variance Inflation Factor) value is Ideal: VIF < 3.3 and acceptable: VIF < 5. (Hair et al., 2021) The lowest VIF value was recorded in indicator Y1 (1.846) and the highest in indicators M10 (3.906) and Y4 (3.860). Although some indicators have VIF values close to 4, all are still within acceptable tolerance limits (< 5), so that no indicators need to be eliminated on the basis of redundancy or high correlation between indicators in one construct. Thus, the constructs of Intellectual Capital (IC), Relational Capital (RC), Innovation Capability (INC), and MSME Performance are declared free from internal multicollinearity, and are worthy of further analysis in the structural model.

4.3. Inner Model Testing (Structural Model)

3.2.1. Model_Fit / Goodness of Fit (GoF)

Table 4. Fit Summary

	Saturated Model	Estimated Model
SRMR	0.033	0.034
d_ULS	1,120	1,178
d_G	0.801	0.829
Chi-Square	4474,935	4473,844
NFI	0.902	0.902

The evaluation of model fit was carried out using model fit indicators provided by SmartPLS, including SRMR, NFI, Chi-Square, d_ULS, and d_G. The results show that the SRMR value of 0.034 is below the threshold of 0.08, indicating that the model has a good fit with the data (Henseler et al., 2016). In addition, the Normed Fit Index (NFI) value of 0.902 also strengthens the evidence that the model is in the good fit category (NFI> 0.90). The Chi-Square, d_ULS, and d_G values are presented as additional information, although in the PLS-SEM approach these values are not the main indicators in assessing model fit.

Overall, the results of the model fit evaluation show that the structural model built has met the global suitability criteria, so that it can be continued to the inner model analysis and hypothesis testing.

3.2.2. Test of Influence Between Variables (Path Coefficient)

Table 5. Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
INC* IC -> MSMEs	-0.014	-0.015	0.032	0.445	0.656

Performance_(MP)					
INC * IR -> MSMEs Performance_(MP)	-0.021	-0.020	0.031	0.668	0.504
Innovation Capability (INC) -> MSMEs Performance_(MP)	0.446	0.447	0.042	10,710	0,000
Intellectual Capital (IC) -> MSMEs Performance_(MP)	0.225	0.225	0.037	6,019	0,000
Relational Capital _(IR) -> MSMEs Performance_(MP)	0.259	0.260	0.027	9,517	0,000

Based on the results of the inner model testing using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach through SmartPLS software, information was obtained regarding the strength and direction of the relationship between latent constructs in this research model. Testing was carried out on five main paths, which included three direct influences and two moderating interaction influences.

First, the Intellectual Capital (IC) variable is proven to have a positive and significant influence on MSME Performance, with a coefficient value of 0.225, a T-statistic value of 6.019, and a p-value <0.001. This shows that the higher the utilization of intellectual capital by MSMEs, the better the performance achieved. Likewise, the Relational Capital (RC) variable also makes a significant contribution to MSME performance with a coefficient value of 0.259, a T-statistic of 9.517, and a p-value <0.001. Both of these findings support the theoretical assumption that intangible assets such as knowledge and external relationships are important determinants in achieving the performance of small and medium enterprises.

In addition, the Innovation Capability (INC) variable also shows a positive and significant influence on MSME performance, with a coefficient value of 0.446, T-statistics of 10.710, and p-value <0.001. This shows that innovation capability is one of the main factors that drives the competitiveness and sustainability of MSMEs in facing market dynamics.

However, in testing the moderation effect, the results show that the interaction between Intellectual Capital (IC) and Innovation Capability (INC) and Relational Capital (RC) and Innovation Capability (INC) does not have a significant effect on MSME performance. The interaction coefficient of Intellectual Capital (IC) × Innovation Capability (INC) is -0.014 (p = 0.656) and Relational Capital (RC) × Innovation Capability (INC) is -0.021 (p = 0.504), both have T-statistic values <1.96. Thus, Innovation Capability is not statistically proven as a moderating variable in the relationship between Intellectual Capital (IC) and Relational Capital (RC) on MSME Performance.

3.2.3. Coefficient of Determination (R^2) Test

Table 6. Coefficient of Determination (R^2)

	R Square	R Square Adjusted
MSMEs Performance_(MP)	0.870	0.870

Evaluation of the predictive power of the model is carried out by analyzing the R Square (R^2) value of the dependent construct, namely MSMEs Performance. Based on the SmartPLS output, the R^2 value was recorded at 0.870, with an identical Adjusted R^2 value. This shows that the combination of independent variables in the model, namely

Intellectual Capital (IC), Relational Capital (RC) , and Innovation Capability (INC), collectively explain 87.0% of the variation in MSME Performance.
Based on the interpretation criteria of (Hair et al., 2021), the R^2 value of 0.870 is included in the substantial category, which reflects a very strong level of explanation of the dependent construct. This finding indicates that the theoretical model used in this study has high predictive power, and the contribution of independent constructs to the variation of MSME performance is significant both practically and theoretically.
Thus, this model is suitable for use in explaining the dynamics of MSME performance in the research context, as well as providing a strong basis for managerial implications and strategic policies based on strengthening intellectual capital, relational capital, and innovation capabilities.

3.2.4. f^2 Test (Effect Size f-squared)

Table 7. f Square Value (f^2)

	INC * IC	INC * IR	Innovation Capability_(INC)	Intellectual Capital (IC)	MSMEs Performance_(MP)	Relational Capital _(IR)
INC * IC					0,000	
INC * IR					0.001	
Innovation Capability_(INC)					0.354	
Intellectual Capital (IC)					0.064	
MSMEs Performance_(MP)						
Relational Capital _(IR)					0.105	

Evaluation of the relative strength of each construct's influence on MSME Performance is done by looking at the f^2 value (effect size). Based on the analysis results, the Innovation Capability (I NC) variable has the greatest influence on MSME Performance with an f^2 value of 0.354, which is included in the large category according to Cohen's criteria (1988). This shows that innovation plays a dominant role in driving overall MSME performance.
Furthermore, the Relational Capital (RC) variable has an f^2 value of 0.105, which is in the small to medium range, indicating a significant but not dominant contribution. Meanwhile, Intellectual Capital (IC) has an f^2 value of 0.064, which is included in the small category, which means the influence of Innovation Capability (INC) on MSME performance is limited when compared to Innovation Capability (INC) .
Meanwhile, the two interaction paths of moderation, namely Intellectual Capital (IC) × Innovation Capability (INC) and Relational Capital (RC) × Innovation Capability (INC), each have f^2 values of 0.000 and 0.001, indicating no significant additional influence on the model when the interaction is included. This is consistent with the results of the previous path coefficient test which showed that the moderating role of Innovation Capability was not statistically significant.
Thus, Innovation Capability is the strongest predictor, while the role of Intellectual Capital (IC) and Relational Capital (RC) are complementary. The strategy to improve MSME performance needs to focus on improving innovation capability in order to achieve optimal results.

4. Discussion

The results of this study indicate a significant and strong relationship between the variables of Intellectual Capital (IC), Relational Capital (RC), and Innovation Capability (INC) on MSME Performance. The model tested in this study produced an R^2 value of 0.870, which means that more than 87% of the variation in MSME performance can be explained by the three constructs. This indicates that the model has high predictive power and is relevant to explain the dynamics of MSME performance in the context of a knowledge-based economy.

4.1. The Influence of Intellectual Capital on MSME Performance

Intellectual Capital (IC) plays an important role in shaping the competitiveness and performance of organizations, including in the context of micro, small, and medium enterprises (MSMEs). The findings of this study reinforce the premise that the management of intellectual assets such as knowledge, skills, and organizational systems has positive implications for business performance. Intellectual capital enables MSMEs to improve operational efficiency, accelerate adaptation to market changes, and optimize the use of internal resources strategically.

In the context of MSMEs, Intellectual Capital (IC) becomes a lever for increasing productivity and innovation. Competent and knowledge-based human resources support the birth of strategic decisions that are more responsive to the dynamics of the business environment. In addition, good documentation of organizational knowledge, for example in the form of procedures or information systems, helps maintain the continuity of business processes even when facing personnel changes or structural changes. Thus, Intellectual Capital (IC) plays a role as the main foundation in building long-term capabilities of MSMEs.

This finding also shows that intellectual capital development is not only relevant in the large corporate sector, but is very strategic for MSMEs that have limited resources. Investment in training, organizational learning, and information digitalization are forms of actualization of intellectual capital that can boost performance sustainably.

4.2. The Influence of Relational Capital on MSME Performance

Relational Capital (RC), as a component of intellectual capital, refers to the quality of external relationships an organization has, including relationships with customers, suppliers, partners, communities, and government agencies. This study shows that relational capital has a significant influence on MSME performance, which confirms that business success is not only determined by internal capabilities, but also by how well business actors build and maintain relationships with external stakeholders.

In the context of MSMEs that often face capital constraints, strong relational networks can act as social resources that provide access to information, markets, and other support. For example, proximity to customers allows MSMEs to obtain rapid feedback on consumer needs and preferences, so they can make more accurate product or service adjustments. Good relationships with suppliers also have an impact on smooth distribution and efficient logistics costs.

On the other hand, strategic partnerships with financial institutions or government agencies allow MSMEs to gain access to funding programs, training, or policy support that are much needed for growth. Therefore, relational capital is not just a complementary element, but a strategic component that directly contributes to the competitive advantage of MSMEs.

4.3. The Influence of Innovation Capability on MSME Performance

Innovation Capability (INC), or innovation capability, has been shown to be a key factor in driving MSME performance. Innovation capability refers to an organization's ability to develop new ideas, introduce new products, processes, or business models, and respond to environmental opportunities and threats with creative approaches. In this study, the role of Innovation Capability (INC) appears to be very dominant in explaining variations in MSME performance, indicating that innovation is no longer an option, but a necessity for the sustainability and growth of small and medium enterprises.

For MSMEs, innovation capabilities can be reflected in various forms, such as developing new products that are more in line with local market tastes, using simple technology to increase productivity, to changing marketing patterns that are more adaptive to the digital era. In a rapidly changing business environment, the ability to innovate is the main differentiator between stagnant MSMEs and those that are able to grow and compete sustainably.

Furthermore, innovation also becomes a bridge to optimize the utilization of Intellectual Capital (IC) and Relational Capital (RC). Without innovation capability, the potential of intellectual and relational capital cannot be realized optimally in the form of real performance. Therefore, building a culture of innovation at the MSME level is an essential strategy in the entrepreneurial ecosystem.

4.4. Moderation Effect: Innovation Capability (INC) × Intellectual Capital (IC) and Relational Capital (RC)

This study also explores the role of innovation capability as a moderating variable in the relationship between Intellectual Capital (IC) and Relational Capital (RC) on MSME performance. However, the results obtained indicate that innovation capability does not play a significant role as a moderator in both relationships.

The absence of this moderation effect can be explained from several perspectives. First, it is possible that innovation capability functions more as a direct variable than as a reinforcement of the relationship between intellectual assets and performance. That is, innovation does not strengthen or weaken the influence of Intellectual Capital (IC) and Relational Capital (RC), but operates as an independent channel of influence. Second, in the context of MSMEs, there may be limitations in the integration between internal knowledge, relational networks, and innovative processes. For example, even though MSMEs have good knowledge and relationships, their innovation capability may not be mature enough to facilitate such influence synergistically.

These results provide insight that the relationships between variables are not always interactive, and it is important to examine other variables that may act as mediators or contingencies in this dynamic.

4.5. Validity and Power of the Model

From the methodological side, this research model has met the criteria of validity and reliability, both in terms of construct measurement (outer model) and structural (inner model). The instruments used show convergent validity, as well as adequate reliability values, thus ensuring that the data obtained consistently represent the intended construct.

More importantly, the structural model shows very strong predictive power, as reflected by the high proportion of MSME performance variance that can be explained by Intellectual Capital (IC), Relational Capital (RC), and Innovation Capability (INC). This shows that these three variables are the main determinants in shaping MSME performance, both theoretically and practically. Evaluation of the strength of the effect (effect size) also shows that innovation capability has a dominant influence compared to Intellectual Capital (IC) and Relational Capital (RC), strengthening the position of innovation capability as a central variable in the model.
This model as a whole provides empirical support for the theoretical framework used, while also being a strong basis for strategic implications in MSME development.

4.6. Contextual and Theoretical Implications

This study contributes to the Knowledge-Based View (KBV) and Dynamic Capabilities View (DCV) frameworks in strategic management theory. KBV emphasizes intellectual and relational capital as intangible resources that provide competitive advantage. In SMEs, this capital is a form of tangible knowledge developed to generate value. This study also highlights the importance of innovation capability in enabling organizations to adapt and change proactively. By integrating these perspectives, this study suggests that SME development strategies should focus on building strong knowledge assets and creating agile systems to adapt to external challenges.

4.7. Managerial / Practical Implications

Intellectual Capital (IP) has a significant impact on the performance of Micro, Small, and Medium Enterprises (MSMEs). To achieve success, MSME managers must invest in employee knowledge and skills, build internal knowledge documentation systems, and encourage a learning culture. Digitalization of business processes can also improve work effectiveness and response to market changes.
Strong Relational Capital (RCAP) is critical to the performance of MSMEs, as it helps them build and maintain relationships with strategic external parties. Embedding a culture of innovation in every aspect of the business, encouraging small-scale experimentation, and allocating resources to innovative activities is essential.
Integration between Knowledge, Relationships, and Innovation is essential for long-term strategy. Integrating KI knowledge into relational and innovative strategies, using input from RK networks, and making innovation a result of interactions between internal and external resources can help SMEs cope with the business environment.
Support from institutions and the government is also important to foster MSMEs. Institutions should design training programs that focus on innovation capabilities, encourage collaboration with business incubators, and provide access to innovative innovations.

5 Conclusions

This study aims to analyze the influence of Intellectual Capital (IC), Relational Capital (RC), and Innovation Capability (INC) on MSME performance, and to evaluate the role of Innovation Capability as a moderating variable in the relationship between Intellectual Capital (IC) and Relational Capital (RC) on performance. Based on the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, a number of important findings were obtained that are relevant both theoretically and practically.

First, this study shows that Intellectual Capital (IC) has a positive influence on MSME performance. This shows that the knowledge, skills, and organizational system assets owned by MSMEs are able to encourage increased business efficiency and productivity.
Second, Relational Capital (RC) has also been shown to contribute positively to MSME performance. Strong relationships with customers, business partners, and external institutions have been shown to be an important source of social and economic support for business sustainability.
Third, Intellectual Capital (IC) emerged as the most dominant factor in influencing MSME performance. The capability to innovate is the main strength for MSMEs in adapting to market changes and developing competitive advantages. This finding confirms the importance of innovation as a core strategy in managing small and medium enterprises.
However, the role of Innovation Capability as a moderator is not proven to be significant in strengthening the influence of Intellectual Capital (IC) and Relational Capital (RC) on MSME performance. This means that innovation capability is more appropriately positioned as a direct predictor rather than an interaction factor in this model.
Overall, this research model is proven to be valid and has very high predictive power. This provides an empirical basis that the management of intellectual and relational capital, as well as the development of innovation capabilities, are effective strategies to improve the performance of MSMEs in a sustainable manner.

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