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Research paper



Enhancing The Performance of Community-Based MSMEs Through Multi-Actor Ecosystem Governance: Evidence from MACTOR Analysis

Raden Isma Anggraini [1] *, Mohammad Syamsul Maarif [1], Zenal Asikin [1], Anggraini Sukmawati [2]

[1] School of Business, IPB University, Jl. Padjajaran, IPB Gunung Gede Campus, Bogor, Indonesia
[2] Department of Management, Faculty of Economics and Management, IPB University, Jl. Agatis, IPB Darmaga Campus, Bogor, Indonesia
**Corresponding author E-mail: ismaanggraini@apps.ipb.ac.id*

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Abstract

Community-based Micro, Small, and Medium Enterprises (MSMEs) are instrumental in promoting inclusive economic development, particularly in developing countries where access to formal employment and capital is often limited. Despite their potential, these enterprises frequently face challenges such as fragmented support systems, low digital readiness, and weak integration with formal policy frameworks. This study aims to examine how multi-actor ecosystem governance can enhance the performance of community-based MSMEs by identifying the influence, roles, and convergence of various institutional and community actors, while integrating the dimensions of intellectual capital. This research employed the MACTOR (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations) method to map and analyze the strategic positions of key actors against strategic objectives derived from literature synthesis and stakeholder interviews. The analysis focused on direct and indirect influence, convergence-divergence relationships, strategic alliances, and actor role typologies in the MSMEs development ecosystem. The results indicate that government institutions, particularly the Ministry of SMEs, local government, and technology companies, hold the highest influence within the ecosystem and align strongly on objectives related to institutional support, financial access, and digital transformation. Educational institutions and NGOs contribute significantly to relational and structural capital, facilitating knowledge sharing and community engagement. Conversely, traditional cooperatives and informal groups demonstrate lower influence and alignment, highlighting areas for targeted capacity-building. Actor convergence mapping identified four clusters with shared priorities, enabling strategic coalition-building across institutional and community actors. These findings offer a novel framework for understanding the dynamics of actor collaboration in community-based MSMEs ecosystems. By integrating intellectual capital with ecosystem governance through MACTOR analysis, this study provides actionable insights for policymakers, development agencies, and community leaders. The research underscores the importance of strategic foresight, actor alignment, and inclusive interventions in promoting resilient and sustainable MSMEs growth.

Keywords: *Community-based MSMEs, Economic development, Intellectual capital, MACTOR analysis, Actor collaboration*

1. Introduction

Micro, small, and medium Enterprises (MSMEs) represent a vital component of economic resilience and community empowerment, particularly in developing countries where they serve as a primary engine for employment, poverty reduction, and inclusive growth (Acs *et al*. 2011; Adenutsi 2023). Indonesia, with over 64 million MSMEs, illustrates this dynamic vividly; the sector contributes more than 60% to the nation's GDP and absorbs most of the labor force (Kemenko Perekonomian 2021). Despite their centrality, MSMEs face systemic vulnerabilities in market access, capital, human resources, and technological integration (Irjayanti & Azis 2012; Hendratmoko 2021). These limitations have been exacerbated by global crises such as the COVID-19 pandemic, exposing the fragility of MSMEs and underscoring the urgent need for more robust, adaptive, and inclusive support ecosystems (Aeni 2022; Junaedi & Salistia 2020).

The community-based MSMEs model emerges as a strategic response to these multifaceted challenges by leveraging local resources, social capital, and cultural values to foster resilience and sustainability (Peredo & Chrisman 2006; Harinurdin *et al.* 2025). This approach emphasizes endogenous development through collaborative mechanisms, knowledge-sharing, and participatory governance, aligning with broader frameworks of inclusive and innovation-led growth (Giampiccoli & Hayward Kalis, 2012; Fauziah & Al Amrie, 2023). However, the effectiveness of community-based MSMEs is contingent on the coherence and synergy among actors within their entrepreneurial ecosystems—including government agencies, financial institutions, civil society organizations, academic institutions, and technology providers (Etzkowitz & Zhou 2017; Autio *et al.* 2014).

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The central research problem addressed in this study lies in understanding the dynamic interplay of actors and their influence in enhancing community-based MSMEs' performance. While policy discourse increasingly emphasizes collaboration and ecosystem approaches (Hermanto & Suryanto 2017), empirical studies focusing on the power relations, strategic roles, and intervention capacities of ecosystem actors remain limited (Cao & Shi 2021). It is essential to identify not only the key stakeholders but also how their interactions shape the governance, resource flows, and strategic orientation of MSMEs embedded within local contexts.

Conventional research on entrepreneurial ecosystems often prioritizes structural elements, such as institutional support or policy instruments, without adequately addressing the agency and influence of actors (Maroufkhani *et al.* 2018; Malecki 2018). This leaves a significant gap in understanding how actor-driven dynamics contribute to the operationalization of ecosystem strategies, particularly in contexts marked by resource constraints, fragmented institutions, and socio-cultural complexity. Without this understanding, policy interventions risk becoming top-down and disconnected from local realities. To address this gap, recent literature has begun to explore actor-centric methodologies that capture the interdependencies, alliances, and power configurations within entrepreneurial ecosystems (Godet 1991; Ariyani & Fauzi 2019). One such method is the MACTOR (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations) analysis, which provides a robust framework to map and evaluate actors based on their levels of influence and strategic convergence or divergence. This approach allows for a nuanced analysis of who holds decision-making power, whose interests are aligned or conflicting, and what strategic coalitions can be mobilized to support MSMEs' development.

Previous studies utilizing MACTOR in the context of regional development and policy planning have demonstrated its potential to inform participatory and evidence-based interventions (Godet & Durance, 2011). In MSMEs research, however, its application remains scarce. The integration of MACTOR with community-based MSMEs frameworks could significantly enhance our understanding of ecosystem dynamics, providing actionable insights into actor roles, expected behaviors, and policy leverage points (Hardjosoekarto 2012).

This study builds on such methodological advancements by applying MACTOR analysis to identify and assess the influence and roles of key actors involved in the development of community-based MSMEs in Indonesia. These include public institutions (Ministry of MSMEs, local government), private sector actors (banks, technology companies), academic and research institutions, and civil society organizations (indigenous communities). By mapping the influence and dependence levels, as well as strategic convergences, the study aims to reveal both synergies and tensions among these actors, thereby providing a clearer picture of the collaborative potential and structural bottlenecks within the ecosystem.

The literature suggests that effective MSMEs performance enhancement is linked not merely to individual capabilities or external supports, but to the quality of multi-actor engagement and knowledge exchange (Ali *et al*. 2022). The concept of intellectual capital, particularly social and relational capital, is central in this discourse, as it shapes trust, cooperation, and the co-creation of value within networks (Bontis 2001; Nahapiet & Ghoshal 1998). Yet, empirical operationalizations of these constructs in actor-network settings remain underdeveloped, necessitating new frameworks that integrate qualitative actor analysis with strategic foresight tools.

Despite the growing interest in entrepreneurial ecosystems and intellectual capital in MSMEs, few studies have successfully synthesized these domains within a coherent analytical model that captures the roles and power dynamics of actors in a developing-country setting. Existing models often lack sensitivity to context-specific challenges such as informal institutions, digital divides, and localized knowledge systems. This limits the transferability and utility of generic policy prescriptions, emphasizing the need for grounded, actor-oriented approaches that reflect local complexities.

Accordingly, this study aims to address the research gap by advancing a model of actor influence and role configuration using MACTOR methodology to strengthen the community-based MSMEs ecosystem. The novelty of this research lies in its integration of strategic actor analysis with the intellectual capital perspective and community empowerment paradigm. This multidimensional approach allows for a deeper exploration of how collaboration, power asymmetry, and actor alignment affect the development and implementation of policies and programs for MSMEs.

The scope of the study encompasses actors operating at national, regional, and community levels, with a focus on those influencing MSMEs embedded in cultural, environmental, and socially driven business contexts. Through MACTOR's dual analysis of influence and convergence, the study not only identifies dominant and dependent actors but also proposes actionable strategies for enhancing synergies and mitigating conflicts. By doing so, the study contributes to both theory and practice in entrepreneurial ecosystem governance, offering a replicable framework for future research and a policy roadmap for inclusive MSMEs development.

2. Methods

The study was conducted between November 2024 and May 2025 in Indonesia. The community-based MSMEs actors in this study are grouped into four clusters: women's communities, indigenous communities, forest farmer groups (KTH), and tofu-tempe artisans. They operate across various sectors, including crafts, agroforestry, food production, and ecotourism. Data were collected through a combination of in-depth interviews, expert surveys, and document analysis. A total of 13 expert respondents were purposively selected from key stakeholder groups, including government institutions, local government officials, financial authorities, academic experts, NGO leaders, bankers, and representatives of community-based MSMEs. These respondents were chosen based on their expertise, involvement in MSME development, and strategic roles in ecosystem governance. Interviews were conducted face-to-face, followed by validation through triangulation with relevant policy documents and literature.

This study employs the MACTOR technique, a strategic foresight and actor analysis tool developed by Michel Godet (1991), to examine the influence and role of actors in the development of community-based MSMEs. The MACTOR software used in this study is MACTOR version 6.1. The MACTOR method has been widely applied in regional development, policy planning, and participatory governance due to its capacity to systematically map actor interdependencies, strategic convergences, and power relations (Godet & Durance 2011; Hardjosoekarto 2012). The research process was structured into 7 key stages: (1) identification of actors and objectives, (2) construct the Matrix of Direct Influence (MDI), (3) calculate the Matrix of Direct and Indirect Influence (MDII), (4) develop map of influences and dependences between actors, (5) construct the Matrix of Actors vs Objectives (MAO), (6) analyze convergences among actors, and (7) determine intervention strategies or recommendations.

Step 1: Identification of actors and objectives

The initial step in the MACTOR (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations) methodology involves identifying the principal actors, or stakeholders, involved in the system or issue under analysis. Alongside actor identification, it is essential to determine the strategic objectives that are the focus of concern or contention among these actors. These objectives represent the desired outcomes, policies, or thematic issues driving the interactions within the system. The formulation of strategic objectives that guide the

MSMEs ecosystem development. Through literature synthesis and consultation with domain experts, a set of strategic objectives was established.

Step 2: Construct the Matrix of Direct Influence (MDI)

The Matrix of Direct Influence (MID) is developed to quantify the direct influence each actor has on others within the system. This is accomplished by evaluating pairwise relationships among actors using a scale, often ranging from 0 (no influence) to 4 (very strong influence). The MID captures power dynamics and hierarchical relationships, thereby shedding light on which actors exert significant influence and which are more passive or influenced. Expert respondent rated their influence on and dependence upon each other using a scale from 0 (no influence) to 4 (very strong influence), based on qualitative judgments and supporting documentation. This resulted in a MDI capturing pairwise influence scores, from which the indirect influence matrix and global influence indices were calculated. The influence index (Ii) and dependence index (Di) of each actor were derived to determine their relative power and vulnerability within the system. These indices were plotted on a Cartesian plane to produce the Influence-Dependence Map.

Step 3: Calculate the Matrix of Direct and Indirect Influence (MDII)

The MDI is then expanded into the MDII (Matrix of Direct and Indirect Influence), which incorporates both direct and indirect influence pathways. This comprehensive matrix evaluates the systemic power of each actor, acknowledging the compound effects of influence through intermediary actors. The MDII is crucial for understanding the broader network of influence within the system and for distinguishing key strategic actors.

Step 4: Develop a Map of Influences and Dependences Between Actors

Based on the results of the MDII, actors are categorized into a typology based on their levels of influence and dependence. The influence-dependence map divides actors into four quadrants: Rely (high influence, high dependence), Dominant (high influence, low dependence), Autonomous (low influence, low dependence), and Dependent (low influence, high dependence). This classification aids in understanding each actor's strategic position and potential role in implementing or resisting change (Fig. 1). In this map, actors are distributed into four quadrants, signifying their strategic roles: Quadrant I (rely actors), Quadrant II (dominant actors), Quadrant III (autonomous actors), and Quadrant IV (dependent actors).

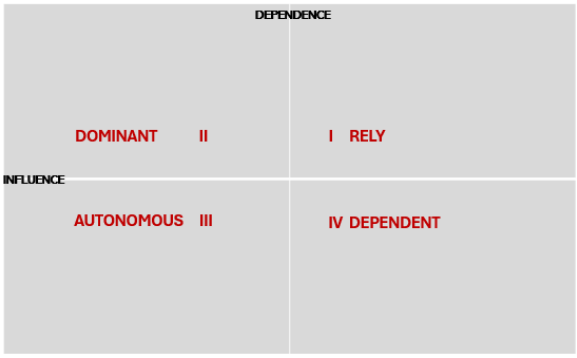


Fig. 1: Map of influences and dependences between actors

Step 5: Construct the Matrix of Actors vs Objectives (3MAO)

The next step entails the construction of the 3MAO matrix, which assesses the level of interest or stance each actor holds toward each strategic objective. This is typically done using a scale from -3 (strongly opposed) to +3 (strongly supportive), with 0 indicating neutrality. The resulting matrix provides a visual representation of actors' inclinations and highlights areas of alignment, neutrality, or opposition concerning each objective. This matrix serves as a foundation for subsequent analyses of alliances and conflicts.

Step 6: Analyze convergences among actors (3CAA)

This step involves the analysis of convergence (shared objectives) among actors. Convergence matrices reveal which actors have similar stances across a set of objectives, indicating potential areas for coalition-building. Divergence matrices, on the other hand, highlight areas of opposition that may give rise to conflict. Together, these analyses provide insights into the structural relationships, possible alliances, and zones of tension within the system. The study developed the actor convergence matrix (3CAA), which assesses the alignment of actors' strategic objectives. Based on expert judgments and textual analysis of policy orientations, the convergence score between actors was calculated, identifying actors with high levels of strategic alignment.

Step 7: Determine intervention strategies or recommendations

The final step involves formulating intervention strategies or policy recommendations based on the overall influence structure, actor typology, and identified alliances/conflicts. Strategies may include collaborative engagement, advocacy campaigns, or conflict resolution mechanisms. These recommendations should be context-sensitive and aligned with the systemic dynamics uncovered through the MACTOR analysis.

Each stage was informed by primary and secondary data, expert validation, and triangulated through document analysis and interview with an expert respondent. This approach aligns with prior actor-network and stakeholder mapping methodologies in development studies (Etzkowitz & Zhou 2017; Ariyani & Fauzi 2019). Throughout the MACTOR process, triangulation with qualitative interviews and policy document reviews ensured the robustness and contextual relevance of the matrices. Survey and an in-depth interview with an expert also played a vital role in validating actor scores, adjusting for potential bias, and refining the classification of actor roles. This participatory element is crucial for building shared understanding and enhancing the legitimacy of actor mapping (Giampiccoli & Hayward Kalis, 2012). The MACTOR technique provides a structured and replicable approach to understanding complex multi-actor dynamics in the development of community-based MSMEs. By capturing not only influence and dependence but also strategic alignment and mobilization, the methodology allows for nuanced policy recommendations and actor-specific engagement strategies. This multi-dimensional approach complements previous ecosystem studies and addresses critical gaps in empirical research on actor roles within inclusive entrepreneurial ecosystems (Autio *et al.* 2014; Maroufkhani *et al.* 2018).

3. Results

The results of this study provide a comprehensive analysis of actor influence and roles in improving the business performance of community-based MSMEs, applying the MACTOR method (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations). The findings are presented in several key subsections, structured according to the stages of MACTOR analysis, including the identification of key actors and objectives, the analysis of direct and indirect influence matrices, convergence-divergence of objectives, influence maps, and role categorization. These results highlight the strategic significance of various institutional and community actors in shaping collaborative strategies and fostering synergistic interventions in the MSMEs ecosystem.

3.1 Step 1 Identification of actors and objectives

1) Identification of actors

Based on the results of in-depth interviews with expert respondents, 13 key actors or stakeholders who played a role in improving the performance of community-based MSME businesses were analyzed using MACTOR. These actors include : (1) Ministry of MSMEs (KemUMKM), (2) Ministry of Tourism (KemPar), (3) Ministry of Creative Economy (Ekraf), (4) Ministry of Environment and Forestry (KLHK), (5) Financial Services Authority (OJK), (6) Local Government (Pemda), (7) Community-based MSMEs actors (MSMEs), (8) National Handicraft Council (Dekranas), (9) Indigenous Peoples Alliance of the Archipelago (AMAN), (10) Indonesian Tofu-Tempeh Producers Cooperative (KOPTI), (11) University, (11) Financial Institutions (Finance), and (13) Technology Company (Company). Each actor was mapped against a strategic objective derived from the synthesis of previous studies and field interviews. Each actor is given a special term (short label) to facilitate the input process into the MACTOR software.

2) Identification of objectives

Identification of objectives is done by referring to the issues and challenges faced by community-based MSMEs. This objective is the basis for analyzing synergies between actors in improving the business performance of community-based MSMEs. These included :

1) Harmonization of policies (Harmony)

Encouraging the harmonization of cross-sectoral policies to inclusively and sustainably support community-based MSMEs.

2) Pro-MSMEs regulation (Policy)

Improving regulations that favor market access, business legality, and protection for community-based MSMEs.

3) Strengthening human capital competence (SDM)

Enhancing the competence and innovation of local human capital through integrated training and mentoring programs.

4) Access and financial literacy (Finance)

Improving access to and literacy in financial services for community-based MSMEs to support business sustainability.

5) MSMEs digitalization (Digital)

Promoting the digitalization of operations and marketing for community-based MSMEs through the use of technology and information systems.

6) Partnership and collaboration (Collabs)

Strengthening business partnerships and multi-stakeholder collaboration in the development of community-based enterprises.

7) Integration of strategic sectors (Integration)

Integrating community-based MSME products into strategic sectors such as tourism, creative economy, and sustainable environmental management.

3.2 Step 2 Construct the Matrix of Direct Influence (MDI)

The Matrix of Direct Influences (MDI) analysis reveals varying degrees of influence among the actors. Based on this, Fig. 2, it can be seen that the Local Government (Pemda) has the highest level of influence in general (dominant value in many rows), especially towards the Ministry of MSMEs (KemUMKM), Community-based MSMEs actors (MSMEs), National Craft Council (Dekranas), and local actors such as the Indigenous Peoples Alliance of the Archipelago (AMAN) and the Indonesian Tofu and Tempeh Producers Cooperative (KOPTI). This shows that the Local Government plays a central role in coordinating, promoting policies, and providing institutional influence on the development of community-based MSMEs. This is in line with Tambunan's research (2023), which highlights that the regional government plays a role as a facilitator, regulator, and catalyst in the development of MSMEs. This role is realized through support for the progress of MSMEs by providing capital assistance, assistance in managing business permits and product certification, supporting digitalization-based business management, and supporting e-commerce-based marketing activities. On the other hand, the Ministry of MSMEs, Financial Services Authority (OJK), financial institutions, and technology companies also show significant influence on many other actors. This shows that the strategic role of cross-sectors (central government, financial authorities, and the private sector) is very important in creating synergies and policy interventions that encourage community-based MSMEs transformation.

MDI	KemUMKM	KemPar	Ekraf	KLHK	OJK	Pemda	MSMEs	Dekranas	AMAN	KOPTI	University	Finance	Company
KemUMKM	0	3	3	2	3	4	3	3	2	2	3	3	3
KemPar	3	0	3	2	1	3	3	4	2	1	2	2	3
Ekraf	3	3	0	1	1	3	4	3	1	2	3	3	4
KLHK	2	2	1	0	1	3	3	2	3	1	2	2	2
OJK	3	1	1	1	0	3	2	1	1	1	2	4	2
Pemda	4	3	3	3	3	0	4	3	3	3	3	3	3
MSMEs	3	2	3	2	2	4	0	3	3	3	2	3	3
Dekranas	3	4	3	2	1	3	3	0	2	2	2	1	2
AMAN	2	2	1	3	1	3	3	2	0	2	2	1	1
KOPTI	2	1	2	1	1	3	3	2	2	0	2	2	2
University	3	2	3	2	2	3	3	2	2	2	0	3	3
Finance	3	2	3	2	4	3	3	1	1	2	2	0	3
Company	3	3	4	2	2	3	3	2	1	2	3	3	0

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Fig. 2: The matrix of direct influence (MDI) between actors

3.3. Step 3 Calculate the Matrix of Direct and Indirect Influence (MDII)

Matrix of Direct and Indirect Influence (MDII) shows how other actors indirectly influence each actor in the system. This influence is mediated through the actions of other actors, providing a broader picture of influence when compared to direct influence in the MDI Matrix. Fig. 3 shows the MDII Matrix, where the Ministry of MSMEs is the most dominant actor in the community-based MSME system because it has a high influence value on almost all other actors. This is followed by the Local Government, technology companies, and community-based MSMEs owners. These four actors have a strategic role because they have a high level of direct influence on community-based MSMEs. Other actors, such as the KOPTI and AMAN, tend to have low direct influence on other actors. This indicates a more limited role in strategic decision-making. Figure 3 also shows that educational institutions and technology companies, while not the most directly influential, significantly affect other actors through knowledge dissemination and innovation diffusion. This supports the literature on knowledge-intensive development and the importance of collaborative innovation (Andreeva & Kianto, 2011; Nonaka & Takeuch, 1995).

MDII	KemUMKM	KemPar	Ekraf	KLHK	OJK	Pemda	MSMEs	Dekranas	AMAN	KOPTI	University	Finance	Company	Ii
KemUMKM	34	27	29	22	21	34	33	27	22	23	28	29	30	325
KemPar	28	28	26	22	20	28	28	27	21	23	26	25	26	300
Ekraf	29	25	30	21	21	30	30	25	21	22	25	26	29	304
KLHK	23	22	22	23	19	24	24	22	22	22	22	21	22	265
OJK	21	20	21	19	22	21	21	19	17	19	20	22	21	241
Pemda	34	27	29	23	21	38	36	27	23	23	28	29	30	330
MSMEs	31	27	27	23	21	33	33	26	22	23	28	27	28	316
Dekranas	27	26	25	21	19	27	27	28	22	22	25	25	26	292
AMAN	22	20	21	21	17	23	23	22	23	20	21	21	22	253
KOPTI	23	22	22	21	19	23	23	22	20	23	22	21	22	260
University	30	26	27	22	21	30	30	26	22	23	28	28	29	314
Finance	28	24	25	20	22	28	27	25	21	21	26	29	27	294
Company	30	25	29	21	21	30	31	26	22	22	27	28	31	312
Di	326	291	303	256	242	331	333	294	255	263	298	302	312	3806

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Fig. 3: The matrix of direct and indirect influence (MDII) between actors

3.4. Step 4: Develop Map of Influences and Dependences Between Actors

Fig. 4 shows the influence of actors in improving the business performance of community-based MSMEs. Quadrant 1 consists of nine actors who have high influence with a high degree of dependency (Relay), namely: Local Government, Ministry of MSMEs, Community-based SMEs actors, University, Technology Companies, Ministry of Creative Economy, Financial Institutions, Dekranas, and Ministry of Tourism. These actors have great influence, but their performance is highly dependent on coordination and support across actors. Quadrant II is occupied by actors who have high influence and a low degree of dependency (Dominant). In this study, no actors were occupying Quadrant II. This shows that improving the performance of community-based MSMEs is interdependent and collaborative, and no single actor is dominant or able to move autonomously without the support of other parties.

Quadrant III consists of actors with low influence and low degree of dependency (Autonomous). Actors in this quadrant have low influence and dependency involved in limited operations and do not have a strategic role for the existence of community-based MSMEs, namely the Ministry of Environment and Forestry, KOPTI, AMAN, and OJK. These actors tend to play a limited role and are not too involved in core interactions between actors to improve the performance of community-based MSME businesses. However, these actors contribute in certain contexts such as environmental conservation, strengthening indigenous communities, or supervising financial institutions. Quadrant IV is theoretically occupied by actors who have low influence and a high degree of dependency in carrying out their roles (Dependent). In Fig. 4, there are no actors who are significantly in quadrant IV, indicating that all actors in the system have a sufficient level of participation and initiative. However, if there are new actors included in Quadrant IV in the future, they need intensive assistance to reduce the degree of dependency and increase their active role to become part of the collaborative solution

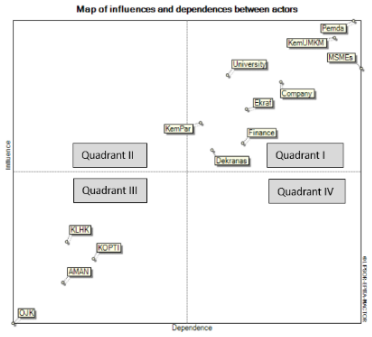


Fig. 4 Map of influences and dependences between actors

The map of influence and dependence among actors shows that only Quadrants I (high influence – high dependence) and III (low influence – low dependence) are occupied, while Quadrants II and IV are empty. This indicates that there are no actors who are both dominant and fully independent within the system (such as a sole regulator with strong authority), nor are there actors who are weak and highly dependent without any influence. Therefore, the community-based MSMEs ecosystem appears to be collaborative and relatively balanced, where key actors such as local governments and the Ministry of MSMEs still rely on the involvement of others, and supporting actors still play meaningful roles. This structure reflects a participatory dynamic that enables governance based on partnerships and mutual interdependence among actors.

3.5. Step 5 Construct the Matrix of Actors vs Objectives (3MAO)

This matrix is useful for identifying key actors, mapping potential collaboration or conflict, and designing synergy strategies between stakeholders. In the context of improving the performance of community-based MSME businesses, the 3MAO Matrix helps understand the readiness and role of each actor in supporting the local economic transformation agenda (Fig. 5)

3MAO	Harmony	Policy	SDM	Finance	Digital	Collabs	Integratio	Mobilisation
KemUMKM	4,4	4,4	4,4	4,4	3,3	4,4	4,4	29,7
KemPar	3,1	2,1	2,1	1,0	2,1	3,1	2,1	15,7
Ekraf	3,1	3,1	3,1	2,1	4,2	4,2	3,1	22,8
KLHK	2,8	2,8	1,9	0,9	1,9	2,8	3,7	16,8
OJK	1,7	2,5	0,8	3,3	1,7	1,7	1,7	13,2
Pemda	4,4	4,4	4,4	3,3	3,3	4,4	4,4	28,7
MSMEs	3,1	4,2	4,2	4,2	4,2	3,1	3,1	26,1
Dekranas	2,0	3,0	3,0	2,0	2,0	3,0	2,0	16,9
AMAN	2,6	2,6	2,6	1,7	0,9	2,6	2,6	15,6
KOPTI	1,8	1,8	2,7	2,7	1,8	1,8	1,8	14,3
University	3,3	3,3	4,4	2,2	3,3	4,4	3,3	24,4
Finance	2,0	3,0	2,0	4,0	3,0	2,0	2,0	17,8
Company	2,1	2,1	2,1	3,2	4,3	3,2	2,1	19,1
Number of agreements	36,4	39,2	37,7	35,0	35,7	40,6	36,3	
Number of disagreements	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Degree of mobilisation	36,4	39,2	37,7	35,0	35,7	40,6	36,3	

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Fig. 5: The 3MAO matrix positions each actor in relation to the goals

Fig. 5 illustrates the level of mobilization of each actor towards the seven strategic objectives of strengthening the performance of community-based MSMEs. The results show that actors from the central and regional government sectors (Ministry of MSMEs and Local Governments) have the most dominant role and high commitment in supporting various aspects of development, ranging from policies, human resources, to collaboration. Community-based MSMEs also show a strong level of mobilization, which is an indicator of internal readiness to change and develop. Other supporting actors, such as universities, technology companies, and financial institutions, play more varied roles. This indicates the importance of strengthening synergy between actors across sectors so that the goals of community-based MSMEs transformation can be achieved more comprehensively and sustainably.

3.6. Step 6 Analyze convergences among actors (3CAA)

The weighted value of the Convergence Actors X Actors (3CAA) is related to the weighted value position matrix of Actors X Objectives (3MAO). It identifies the number of common positions on objectives (pro or against) for a pair of actors. This analysis also reveals potential alliances while considering the actors' preferences regarding objectives and their competitiveness. This matrix illustrates the level of convergence or similarity of views between actors towards other actors in the system being studied. Fig. 6 presents the Convergence Matrix between actors in improving the performance of community-based MSMEs. The actor with the highest convergence score is the Ministry of MSMEs (293.7), community-based MSME actors (288.2), and KOPTI (264.8) occupy the top position in terms of convergence. This shows that these three actors are seen as the main actors who are the center of attention and reference in formulating cross-sector strategies. The high convergence towards these actors reflects a strong consensus among stakeholders regarding the importance of policy support, strengthening the capacity of business actors, and developing local economic institutions. In contrast, actors such as the OJK and related agencies in the Local Government show lower convergence, indicating the need for increased coordination and integration of their roles in order to contribute more effectively to empowering community-based MSMEs.

3CAA	KemUMKM	KemPar	Ekraf	KLHK	OJK	Pemda	MSMEs	Dekranas	AMAN	KOPTI	University	Finance	Company
KemUMKM	0,0	22,7	26,3	23,2	21,5	29,2	27,9	23,3	22,6	22,0	27,0	23,7	24,4
KemPar	22,7	0,0	19,3	16,2	14,4	22,2	20,9	16,3	15,6	15,0	20,0	16,7	17,4
Ekraf	26,3	19,3	0,0	19,8	18,0	25,8	24,5	19,9	19,2	18,6	23,6	20,3	21,0
KLHK	23,2	16,2	19,8	0,0	15,0	22,7	21,4	16,8	16,2	15,5	20,6	17,3	17,9
OJK	21,5	14,4	18,0	15,0	0,0	21,0	19,6	15,1	14,4	13,7	18,8	15,5	16,2
Pemda	29,2	22,2	25,8	22,7	21,0	0,0	27,4	22,8	22,1	21,5	26,5	23,2	23,9
MSMEs	27,9	20,9	24,5	21,4	19,6	27,4	0,0	21,5	20,8	20,2	25,2	21,9	22,6
Dekranas	23,3	16,3	19,9	16,8	15,1	22,8	21,5	0,0	16,3	15,6	20,7	17,4	18,0
AMAN	22,6	15,6	19,2	16,2	14,4	22,1	20,8	16,3	0,0	14,9	20,0	16,7	17,4
KOPTI	22,0	15,0	18,6	15,5	13,7	21,5	20,2	15,6	14,9	0,0	19,3	16,0	16,7
University	27,0	20,0	23,6	20,6	18,8	26,5	25,2	20,7	20,0	19,3	0,0	21,1	21,8
Finance	23,7	16,7	20,3	17,3	15,5	23,2	21,9	17,4	16,7	16,0	21,1	0,0	18,5
Company	24,4	17,4	21,0	17,9	16,2	23,9	22,6	18,0	17,4	16,7	21,8	18,5	0,0
Number of convergences	293,7	216,7	256,1	222,7	203,3	288,2	273,9	223,6	216,3	209,0	264,8	228,4	235,7
Degree of convergence (%)	0,0												

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Fig. 6: Weighted valued convergences actors x actors' matrix (3CAA)

Fig. 7 presents the Graph of Order 3 Convergences Between Actors, showing the level of relationship and cooperation between the main actors involved in improving the performance of community-based MSMEs. This graph shows the similarity or alignment of views between actors towards other actors in the system. This graph has lines and colors that indicate the level of convergence between actors, which is related to how close their goals are to each other. The Ministry of MSMEs is at the center of the network a very strong level of convergence (red line) connected to the Local Government (with Pemda) and a strong level of convergence (thick blue line) connected to the Ministry of Environment and Forestry (KLHK), Higher Education (University), Community-based MSMEs actors (MSMEs), and the Ministry of Creative Economy (Ekraf). The red line connecting the Ministry of MSMEs and the Local Government shows the highest level of alignment of views among all the relationships analyzed. This indicates that the Local Government (Pemda) is very much in line with the Ministry of MSMEs in terms of strategy, policy, and perception of the goals and other actors in the community-based MSMEs development

ecosystem. This very strong convergence reflects close coordination between the central government and local governments. This is an important foundation in ensuring the effectiveness of the implementation of community-based MSMEs empowerment programs at the regional level, as well as strengthening vertical integration in improving the business performance of community-based MSMEs.

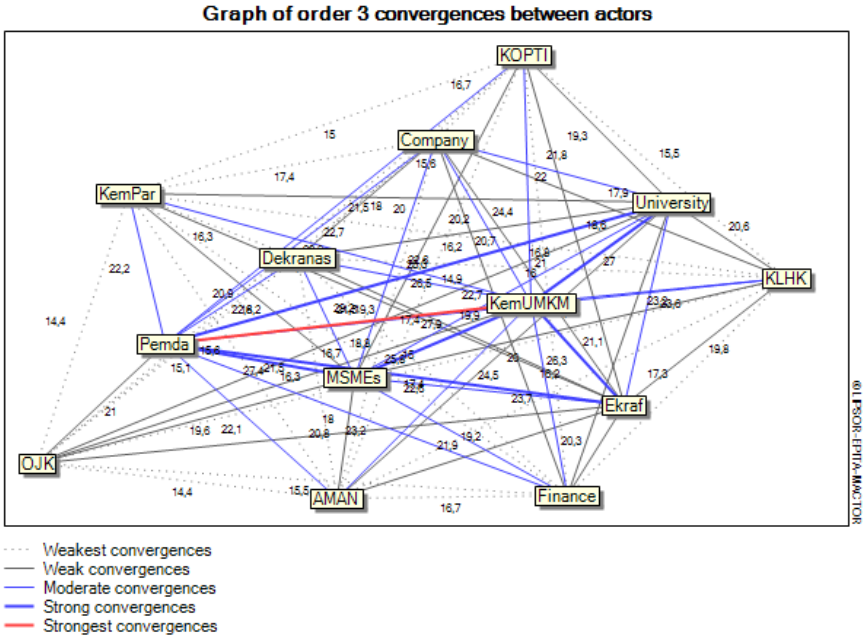


Fig. 7: Graph of order 3 convergences between actors

3.7 Step 7 Determine intervention strategies or recommendations

The intervention strategy should focus on leveraging high-influence actors (such as the Ministry of MSMEs and Local Government) while fostering multi-actor collaboration grounded in strategic convergence. These actors, categorized as Rely Actors, hold significant systemic influence but also depend on other stakeholders to enact change. Therefore, policy recommendations should include the institutionalization of multi-level coordination platforms, promotion of cross-sectoral partnerships, and development of convergence-based coalitions around shared objectives such as digital transformation, financial access, and human capital development. At the same time, marginalized actors such as AMAN, KOPTI, and OJK require targeted empowerment through structured involvement in policy platforms, capacity-building programs, and participatory planning processes to strengthen their roles in the ecosystem.

Additionally, integrating intellectual capital into these interventions is critical for long-term resilience. Universities, NGOs, and technology firms can serve as knowledge intermediaries to disseminate structural and relational capital through community training, trust-building initiatives, and innovation hubs. Policymakers are encouraged to adopt adaptive governance models that utilize updated MACTOR data to monitor dynamic actor relationships and guide evidence-based adjustments to strategy. These interventions collectively aim to create a collaborative, inclusive, and context-sensitive ecosystem for sustainable community-based MSMEs development.

4. Discussions

The findings of this study provide critical insights into the dynamics of actor influence, convergence, and strategic role typologies within the ecosystem of community-based MSMEs. By employing the MACTOR technique, this research articulates a detailed view of actor interdependencies, strategic alignment, and influence structures, contributing to the development of an integrative governance model for MSMEs. This discussion elaborates on the core themes that emerged from the analysis: actor influence and relational interdependence, convergence zones for strategic alignment, the mobilization of intellectual capital, and policy implications for inclusive ecosystem governance.

4.1 Actor influence and relational interdependence

The analysis of the Matrix of Direct Influence (MDI) and Matrix of Direct and Indirect Influence (MDII) revealed a complex web of interdependencies among ecosystem actors. Local Government (Pemda), Ministry of MSMEs (KemUMKM), and technology firms (Company) emerged as the most influential entities within the system, consistent with literature on central actor roles in decentralized governance contexts (Tambunan 2023; Etzkowitz & Zhou 2017). These actors not only demonstrated high direct influence scores but also served as key intermediaries in indirect influence pathways, confirming their systemic importance.

The influence-dependence map further clarified the strategic positions of various actors. The dominance of Quadrant I (Rely) actors indicated a high degree of systemic interdependence, whereby influential actors are also dependent on others to operationalize interventions. This mutual dependence suggests a participatory and collaborative governance arrangement, rather than a top-down or siloed approach, echoing Autio *et al.* (2014) and Isenberg (2011), who argue for distributed agency in entrepreneurial ecosystems. Conversely, the presence of actors in Quadrant III (Autonomous), such as AMAN, KOPTI, OJK, and KLHK, suggests a need to better integrate these actors into core collaborative processes through targeted engagement strategies.

4.2 Convergence zones and strategic alignment

The construction of the 3MAO and 3CAA matrix sheds light on the alignment of actors with strategic objectives, identifying areas of convergence that can serve as entry points for coalition-building. The convergence analysis confirmed strong alignment among key institutional actors: the Ministry of MSMEs, Local Government, and community-based MSMEs actors, particularly about objectives such as digitalization, financial literacy, and multi-stakeholder collaboration. This strategic alignment underscores the importance of relational capital in enabling effective governance structures (Nahapiet & Ghoshal, 1998). The presence of strong convergence networks, especially as shown in the Order 3 Convergence Graph, illustrates the potential for cross-sector collaboration. The strong bond between the Ministry of MSMEs and Local Government (indicated by the red line in the convergence graph) reflects vertical coordination that is essential for scaling community-level interventions. This aligns with the notion of vertical integration in policy implementation articulated by Fauziah & Al Amrie (2023), where national and local actors coalesce to drive local development outcomes. However, the lower convergence scores of actors such as OJK and some decentralized agencies indicate potential fragmentation or lack of clarity in policy orientation. This divergence highlights the importance of creating integrative policy frameworks that explicitly define roles, expectations, and coordination mechanisms, thus avoiding overlap or conflict in actor mandates (Cao & Shi 2021).

4.3 Mobilization of intellectual capital through actor roles

The findings highlight that actor roles in mobilizing intellectual capital (IC) are diverse and context-dependent. Universities and NGOs, for instance, were shown to contribute predominantly to structural and relational capital by facilitating training programs, building trust networks, and codifying knowledge-sharing practices. These findings support previous work by Nonaka & Takeuchi (1995) and Andreeva & Kianto (2011), which emphasize the role of knowledge brokers in innovation ecosystems. Moreover, the pivotal role of Local Government and the Ministry of MSMEs in enabling human capital development through policy support and funding mechanisms aligns with the intellectual capital framework proposed by Bontis (2001). Their actions enable capability formation, particularly through facilitating access to digital tools and market linkages. Yet, as Pergelova & Yordanova (2025) note, human capital enhancement must be accompanied by talent management strategies and mechanisms for continuous learning, especially in rural or underserved areas. Financial institutions also emerged as critical in mobilizing structural capital, not just through the provision of credit, but by shaping financial behavior and literacy. This confirms findings by Boudreaux *et al.* (2021), who noted that access to finance combined with financial education significantly boosts MSMEs' productivity. Nevertheless, the lower convergence and influence scores of OJK suggest a gap in translating regulatory oversight into grassroots impact. This disconnect may stem from structural rigidities or insufficient outreach mechanisms.

4.4 Policy implications for inclusive ecosystem governance

The absence of actors in Quadrant II (Dominant) and Quadrant IV (Dependent) of the influence-dependence map is notable. This implies that the MSMEs ecosystem lacks actors who are entirely independent and powerful or those who are entirely dependent and powerless. While this could be interpreted as a sign of a balanced and collaborative ecosystem, it may also point to the absence of a central driver that can unilaterally implement system-wide reforms. This supports arguments by Maroufkhani *et al.* (2018) that inclusive ecosystem governance must rely on distributed leadership models, where multiple actors share responsibility and authority.

Furthermore, the strong clustering of actors in the relay quadrant suggests a need for enhanced coordination platforms. These could take the form of inter-agency working groups, digital knowledge hubs, or public-private councils focused on MSMEs development. As Dunggio *et al.* (2024) and Armada *et al.* (2024) argue, especially in the context of women-led MSMEs, the efficacy of such platforms depends on their ability to address gendered and localized barriers through participatory design.

The analysis also points toward the potential of adaptive governance defined by flexible, iterative policy-making informed by real-time feedback from stakeholders. As seen in the case of the Ministry of MSMEs and Local Government, their strong convergence and influence suggest they are well-positioned to lead adaptive interventions. This is especially relevant for addressing emergent challenges such as digital transformation, where policy agility and actor responsiveness are critical.

Additionally, the importance of sectoral integration as an objective, linking MSMEs with tourism, creative economy, and environmental management, presents a case for ecosystemic thinking in policy design. Integrated strategies that cut across ministerial silos can unlock synergies and scale community impact. This aligns with the community-based enterprise theory by Peredo & Chrisman (2006), which emphasizes endogenous growth driven by the interplay of local assets and collective agency.

4.5 Limitations and future directions for actor-based ecosystem research

While the MACTOR method provides a structured and robust framework for analyzing actor roles and influence, it is not without limitations. The reliance on expert judgment introduces the potential for bias, especially in score allocation for influence and convergence matrices. Although this study mitigated bias through triangulation and validation interviews, future studies could explore mixed-method designs incorporating social network analysis or agent-based modeling to enhance empirical rigor. Moreover, the current analysis represents a snapshot in time. Actor roles, influence patterns, and convergence scores are dynamic and can shift with political, economic, or technological changes. Longitudinal studies would provide deeper insights into how actor configurations evolve, and how these changes affect the performance and sustainability of MSMEs over time.

Finally, greater attention should be directed toward marginalized actors, such as informal cooperatives or indigenous community groups, whose low influence scores do not reflect their potential for grassroots innovation and resilience. Integrating these voices into formal governance mechanisms remains a critical challenge and opportunity for inclusive ecosystem development (Giampiccoli & Hayward Kalis, 2012).

This discussion has demonstrated that enhancing the performance of community-based MSMEs requires not only identifying influential actors but also understanding their interdependencies, strategic roles, and capacity to mobilize intellectual capital. The insights from this study lay the groundwork for designing integrative, actor-sensitive policies that align with the dynamic realities of entrepreneurial ecosystems in developing contexts.

5. Conclusion

This study highlights the significance of actor influence, convergence, and strategic alignment in enhancing the performance of community-based MSMEs through the integration of intellectual capital and the entrepreneurship ecosystem. By employing the MACTOR method, the research uncovered a nuanced landscape of power dynamics, actor roles, and collaboration patterns within Indonesia's MSMEs development framework. The Ministry of MSMEs, local governments, technology companies, and universities (educational institutions) were identified as central actors with the capacity to lead synergistic initiatives.

The convergence analysis revealed fertile ground for strategic coalitions among actors who share aligned objectives, particularly in institutional strengthening, digital inclusion, and financial access. The identification of actor clusters and convergence zones enables stakeholders to prioritize partnerships that maximize ecosystem-wide impact. This study contributes to the body of knowledge by integrating actor-based foresight tools with MSMEs ecosystem frameworks, offering a replicable approach for policy formulation and intervention planning. Further research is encouraged to explore longitudinal changes in actor roles, digital transformation trajectories, and the integration of marginalized voices in ecosystem governance. Ultimately, the study affirms that sustainable MSMEs development requires multi-actor coordination, strategic foresight, and inclusive policy design.

Author contributions

All proposed the topic of this research and designed the study, and collected the data. All the authors contributed to the preparation of the final draft of the manuscript, which was reviewed and critically reviewed for intellectual content, as well as drafting and revising the final manuscript. All authors approved the final version of this manuscript.

Conflict of interest

The authors declare that there is no conflict of interest.

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