



Exploring The Dynamics of Digital Transformation in Entrepreneurship and MSMEs : A Systematic Literature Review Using Prisma and Bibliometric Analysis

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ABSTRACT

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Digital transformation has become increasingly important in strengthening the competitiveness of micro, small, and medium-sized enterprises (MSMEs) in an increasingly digitalized economy. However, this transformation process has not progressed evenly, as many MSMEs continue to face various barriers, including limited organizational capacity, insufficient institutional support, and socio-cultural factors that influence technology adoption. This study employed a Systematic Literature Review (SLR) approach guided by the PRISMA protocol and supported by bibliometric analysis to examine the development of research on digital transformation in entrepreneurship and MSMEs. Based on 11 selected articles published between 2010 and 2024, the findings show that MSME digital transformation is shaped by multiple dimensions, particularly market orientation, entrepreneurial capacity, financial inclusion, governance, as well as socio-cultural and institutional factors. The mapping results also indicate that publications have increased since 2020 and remain concentrated in Southeast Asia and Europe. These findings confirm that digital transformation in MSMEs should not be understood merely as technology adoption, but as a multidimensional process shaped by the interaction of organizational, social, and institutional factors.

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INTRODUCTION

Digital transformation has brought significant changes in the way businesses create value, interact with customers, and maintain competitiveness in an increasingly technology-driven economy. For micro, small, and medium enterprises (MSMEs), the application of digital technology has become increasingly important because it can expand market access, improve operational efficiency, and stimulate innovation in entrepreneurial activities. In this context, digital transformation is no longer viewed merely as an optional strategy, but as an increasingly important requirement for business sustainability and growth in the digital era (Sinulingga & Nasution, 2024). However, the adoption of digital transformation among MSMEs remains uneven,

particularly in developing countries where many businesses still face limited digital capability, weak institutional support, and insufficient socio-cultural readiness. Therefore, digital transformation in MSMEs should not be understood solely as the application of technology, but rather as a multidimensional process influenced by organizational, social, and institutional factors.

MSMEs play a strategic role in driving economic growth, creating employment opportunities, reducing poverty, and strengthening regional economic resilience, particularly in developing countries where small businesses dominate economic activity. In many emerging economies, MSMEs also contribute significantly to household income and local economic development (Sinha et al., 2024). Despite this important role, the ability of MSMEs to adapt to digital transformation remains highly uneven. Barriers such as limited capital, low digital literacy, inadequate technological infrastructure, and minimal institutional and policy support continue to hinder digital adoption. In addition, socio-cultural factors such as resistance to change, a weak innovation culture, and low collaborative capacity further constrain the transformation process (Rahayu et al., 2023). As a result, not all MSMEs are equally able to benefit from digital opportunities, and many still struggle to survive in increasingly digitalized markets. This condition indicates that digital transformation in MSMEs is not only a technological issue, but also a matter of organizational capability, social dynamics, and institutional support.

Research on digital transformation in MSMEs has so far largely focused on technological adoption, business performance, innovation capability, and organizational efficiency. Much of the literature explains digital transformation from managerial and technology-oriented perspectives, emphasizing the role of digital tools, market orientation, and competitive advantage in improving MSME performance. For instance, studies have shown that digital entrepreneurship contributes to innovation, competitiveness, and economic growth, while dynamic capabilities and corporate entrepreneurship are considered essential for organizational adaptation in the digital era ((Cavallo & Ghezzi, 2021) (D'Angelo et al., 2021)). Likewise, (Abduh et al., 2024) demonstrate that entrepreneurial orientation and market responsiveness are important in enabling MSMEs to leverage digital technologies in Society 5.0. These studies have made important contributions in explaining how digital technology can support business growth, improve operational effectiveness, and strengthen entrepreneurial innovation. Nevertheless, existing studies still tend to position digital transformation primarily as a technical and organizational process, with relatively limited attention given to the broader social, cultural, and institutional dimensions that shape the transformation experience of MSMEs.

In practice, the ability of MSMEs to adopt and sustain digital transformation is not determined by technological readiness alone. Social and cultural conditions, community relationships, collaborative networks, local values, institutional trust, and access to supportive ecosystems also play important roles in determining whether digital transformation can be implemented effectively and sustainably. Previous studies indicate that digital transformation may fail or stagnate when organizations and communities are unable to adapt socially and culturally to technological change. For example, (Bagrationi et al., 2021) argue that resistance to digital transformation is often rooted in socio-cultural factors that weaken social capital, collaboration, and trust. Similarly, (Herutomo et al., 2022) suggest that digital transformation can also be linked to social entrepreneurship and community-based innovation, indicating that digitalization should not only generate economic value but also support broader social goals. However, these dimensions remain insufficiently explored in the existing literature, particularly in developing

countries where MSMEs are strongly embedded in local social structures and informal economic systems. Consequently, understanding how organizational capacity, social dynamics, and institutional environments interact in shaping MSME digital transformation remains relatively limited.

These limitations demonstrate the need for a more comprehensive understanding of digital transformation in MSMEs, one that does not focus only on technology adoption and business performance but also considers the influence of social, cultural, and institutional contexts on the transformation process. This need is further reflected in previous studies that tend to discuss digital transformation in fragmented ways by separating technology adoption, innovation capability, financial inclusion, organizational performance, business strategy, governance, and regulatory issues into distinct discussions. For example, (Harasim & Klimontowicz, 2021) highlight the importance of digital payment systems, (Santoso & Rachman, 2023) emphasize regulatory digitalization through halal certification, while (Utami & Supriadi, 2023) focus on digital service quality in banking, fintech, and cooperatives. Although these studies provide valuable insights, they are rarely integrated into a broader socio-economic perspective that explains how technological readiness interacts with organizational capability, community participation, social embeddedness, and institutional support in shaping inclusive and sustainable digital transformation among MSMEs.

Therefore, this study seeks to address this gap by presenting a systematic and integrative review of the literature on digital transformation in entrepreneurship and MSMEs through a Systematic Literature Review (SLR) guided by the PRISMA protocol and supported by bibliometric analysis. This study is based on the view that digital transformation in MSMEs is not merely the adoption of digital technology, but a multidimensional transformation process shaped by organizational capability, socio-cultural conditions, collaborative networks, and institutional support systems. More specifically, this study aims to identify dominant research themes, theoretical perspectives, methodological trends, influential authors, and emerging issues in the literature on digital transformation in entrepreneurship and MSMEs. It also examines how previous studies have conceptualized the relationship between digital transformation, innovation, community participation, financial inclusion, and institutional dynamics within MSME ecosystems.

This study contributes to the existing literature by integrating fragmented discussions on technological adoption, organizational capability, social engagement, and institutional support into a more holistic understanding of MSME digital transformation. Unlike many previous studies that predominantly emphasize technological and performance-oriented perspectives, this research highlights the importance of socio-cultural and institutional dimensions in shaping the sustainability and inclusiveness of digital transformation processes among MSMEs. Through this integrative perspective, the study is expected to enrich academic discourse on MSME digital transformation while also providing practical implications for policymakers, practitioners, and stakeholders in designing more adaptive, inclusive, and sustainable digital transformation strategies, particularly in developing-country contexts.

LITERATURE REVIEW

Technology and Performance

Studies on digital transformation in MSMEs have largely focused on technology adoption and improving business performance. So, digital transformation is understood as a strategy that can help MSMEs improve operational efficiency, expand market reach, strengthen competitiveness, and enhance innovation capacity. Some of the literature emphasizes how digital technology supports entrepreneurial activities through the development of more effective business processes, improved customer interactions, and the ability to respond more quickly to market changes. Therefore, technology is viewed as a strategic resource that enables MSMEs to survive and compete amidst the increasingly dynamic development of the digital economy.

Several studies also emphasize the importance of entrepreneurial orientation, market responsiveness, and organizational capabilities in determining the success of MSME digital transformation. (Abduh et al., 2024) showed that entrepreneurial orientation and market orientation significantly influence the ability of MSMEs in the creative industry sector to utilize digital technology in the Society 5.0 era. This research demonstrates that digitalization can help MSMEs strengthen relationships with consumers, increase market adaptability, and open new business opportunities. Similarly, (Cavallo & Ghezzi, 2021) explain that digital entrepreneurship contributes significantly to economic growth and increased competitiveness by strengthening innovation and expanding business opportunities in the digital ecosystem. Meanwhile, (D'Angelo et al., 2021) emphasize that dynamic capabilities and corporate entrepreneurship are crucial factors enabling organizations to navigate technological disruption and market uncertainty. Overall, these studies demonstrate that digital transformation is closely linked to organizational learning, innovation capability, and strategic adaptive capacity.

Despite its important contributions, technology and performance-oriented perspectives still tend to view digital transformation as a managerial and organizational process, primarily driven by efficiency, competitiveness, and technological capabilities. Most research focuses primarily on the impact on performance and the benefits of innovation, while attention to the socio-cultural and institutional dimensions that influence MSME digital transformation remains relatively limited. Consequently, digital transformation is often understood through approaches that focus on technology and organizational performance, but few explorations of how social relations, community dynamics, and the institutional environment influence the long-term sustainability of the transformation. This condition indicates that studies on digital transformation in MSMEs require a broader analytical approach and are not limited to aspects of technological readiness or business performance.

Socio-Cultural and Community

In contrast to approaches that emphasize technological aspects, several studies have shown that digital transformation in MSMEs is also strongly influenced by social and cultural conditions, community dynamics, and collaborative relationship patterns within the local business environment. This explains that the success of digital transformation cannot be explained solely by technological capabilities or organizational performance, as MSMEs fundamentally grow and develop within social structures, informal networks, and community-based interactions. Therefore, digital transformation is beginning to be understood as a social process involving trust-building,

shared participation, cultural adaptation, and the formation of collaborative ecosystems capable of supporting sustainable innovation.

(Herutomo et al., 2022) explain that digital transformation has the potential to support the achievement of the Sustainable Development Goals (SDGs) by strengthening social entrepreneurship and community-based innovation. This research demonstrates that digital technology not only opens economic opportunities but can also create social value through increased community participation and the development of collaborative solutions to various social problems. On MSMEs, this perspective emphasizes that the digitalization process needs to be adapted to local values, social needs, and community empowerment efforts to ensure sustainable transformation. Similarly, (Bagrationi et al., 2021) revealed that resistance to digital transformation often arises from social and cultural factors, such as low trust in institutions, a weak collaborative culture, and declining social capital within the business community. These findings demonstrate that digital transformation has the potential to fail when organizations and communities are unable to adapt socially and culturally to technological changes.

From this socio-cultural perspective, digital transformation is understood not only as a process of technology adoption but also as a process heavily influenced by social interactions, community engagement, and relationships between business actors. However, existing research still lacks sufficient clarity on how these social and cultural factors interact with organizational capacity and institutional support in the digital transformation process of MSMEs. Furthermore, community-based approaches are often discussed separately from strategic and technological aspects, resulting in a fragmented understanding of the sustainability and inclusiveness of digital transformation in MSMEs. Therefore, a more integrative approach is needed to explain the interrelationships between socio-cultural conditions, collaborative ecosystems, organizational capacity, and the institutional environment in shaping the overall digital transformation of MSMEs.

Institutional and Governance

In addition to technological and socio-cultural aspects, several studies also emphasize that digital transformation in MSMEs is significantly influenced by institutional support, governance, and the surrounding regulatory environment. Digital transformation is not only understood as an internal organizational process or social change, but also as a process that requires supportive policies, adequate digital infrastructure, an inclusive financial system, and institutional mechanisms capable of encouraging technology adoption while maintaining business sustainability. In other words, the success of digital transformation in MSMEs depends heavily on the extent to which the government, financial institutions, and regulatory bodies can build an ecosystem that facilitates MSMEs' effective and equitable access to various digital opportunities.

(Harasim & Klimontowicz, 2021) explain that digitalization is a crucial factor in the development of modern payment systems, particularly in increasing transaction efficiency, strengthening consumer trust, and expanding access to financial services. These findings indicate that digital financial systems play a significant role in encouraging broader participation in the digital economy. Similarly, (Rahayu et al., 2023) state that digital financial inclusion can help informal MSMEs enter the formal economy by increasing access to financial services and digital business systems. In the Indonesian context, (Santoso & Rachman, 2023) demonstrated that digitalization of halal certification can increase transparency, strengthen trust in institutions, and

support business competitiveness through more efficient regulatory processes. Meanwhile, (Utami & Supriadi, 2023) found that the quality of digital services in the banking, fintech, and cooperative sectors significantly influences customer satisfaction and loyalty, indicating that institutional quality and digital governance are essential components of sustainable digital transformation. At the regional level, (Ecleo et al., 2023) also emphasized that digital governance initiatives, such as digital city programs, can stimulate local economic growth, create job opportunities, and improve the quality of public services through technology-based policies.

Overall, these studies demonstrate that institutional capacity, governance quality, regulatory support, and financial infrastructure are important factors in driving digital transformation in MSMEs. However, existing studies tend to discuss the institutional and governance dimensions separately from the socio-cultural and organizational aspects. Most research focuses on policy implementation, financial systems, or regulatory efficiency, but has little explanation of how the institutional environment interacts with community dynamics, organizational capacity, and local socio-cultural conditions in shaping sustainable digital transformation. Consequently, understanding MSME digital transformation remains fragmented into separate technological, social, and institutional domains. Therefore, a more integrated analytical framework is needed to explain how governance systems, institutional support, organizational readiness, and the socio-cultural environment collectively influence the inclusiveness and sustainability of MSME digital transformation.

In general, these various perspectives demonstrate that digital transformation in MSMEs is a complex process and cannot be understood from a single approach. The technology and performance perspectives explain the importance of innovation, efficiency, and competitiveness in driving transformation, while the socio-cultural perspective emphasizes the role of social relationships, community participation, and social embeddedness in supporting the process. Furthermore, the institutional and governance perspectives also demonstrate that policies, regulations, financial infrastructure, and institutional support have a significant influence on the success of MSME digital transformation. However, existing studies tend to discuss each of these dimensions separately, thus failing to provide a complete picture of how technological, social, organizational, and institutional factors interrelate within the MSME ecosystem. Therefore, a more systematic and comprehensive synthesis is needed to better understand the key patterns, conceptual relationships, and research gaps in the study of MSME digital transformation.

Systematic Literature Review (SLR)

The Systematic Literature Review (SLR) approach has become a cornerstone methodology in academic research, particularly when investigating complex, interdisciplinary topics such as digital transformation (Marzi et al., 2025). Unlike traditional literature reviews that may lack transparency and replicability, SLRs adhere to structured and predefined procedures that ensure rigor, minimize bias, and enhance reliability. An SLR involves identifying, selecting, evaluating, and synthesizing research evidence in a manner that allows other scholars to replicate the process and verify its conclusions.

In management, entrepreneurship, and information systems, SLRs are increasingly used to map research landscapes, identify gaps, and consolidate fragmented knowledge (D'Angelo et al., 2021). They allow researchers to go beyond anecdotal or sector-specific insights, providing a comprehensive overview of how concepts have evolved over time. For digital transformation in

MSMEs, this methodology is particularly valuable as it helps capture the breadth of research across different contexts economic, technological, and social.

By systematically synthesizing evidence, an SLR can identify not only recurring themes but also emerging perspectives and under-researched areas. For example, while much of the literature focuses on technological adoption and business models, fewer studies emphasize the role of community engagement, cultural norms, and regulatory frameworks. This gap signals the need for integrative frameworks that bridge technical, economic, and socio-cultural perspectives. The SLR methodology thus enables a more balanced understanding of digital transformation in entrepreneurship, ensuring that the review goes beyond technological determinism.

PRISMA Protocol

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol has become the gold standard for conducting systematic reviews across disciplines. PRISMA provides a structured four-phase process: identification, screening, eligibility, and inclusion. This framework enhances transparency by documenting each step of the literature selection process, ensuring that the review is both rigorous and replicable. In this study, PRISMA is employed to filter relevant publications on digital transformation, entrepreneurship, and MSMEs.

The identification stage involves database searches using predefined keywords such as “digital transformation,” “MSMEs,” “entrepreneurship,” “social innovation,” and “financial inclusion.” The screening process removes duplicates and irrelevant records, while the eligibility stage involves assessing full-text articles against inclusion and exclusion criteria. Finally, the inclusion stage confirms the final set of studies that meet all criteria. The strength of PRISMA lies in its ability to reduce bias and improve methodological rigor. By clearly documenting the process, it ensures that readers can evaluate the validity of the review. For research on digital transformation, PRISMA is especially useful because the topic spans multiple disciplines and contexts, making systematic filtering and selection essential. Through PRISMA, this study ensures that only high-quality, peer-reviewed research forms the basis of its analysis, thereby strengthening the credibility of its findings.

Bibliometric Analysis

Bibliometric analysis provides a complementary quantitative approach to understanding the structure and dynamics of academic knowledge. It involves the statistical analysis of publications, citations, co-authorships, and keywords, offering insights into the intellectual landscape of a research field. Bibliometric methods allow researchers to identify influential authors, institutions, and countries, as well as to track emerging trends and thematic clusters over time. In digital transformation, bibliometric analysis has been increasingly used to map research trajectories and identify dominant themes. For example, (Harasim & Klimontowicz, 2021)) highlight how digitalization drives the evolution of new payment systems, while (Santoso & Rachman, 2023) demonstrate the regulatory implications of digital halal certification. Bibliometric mapping tools such as VOSviewer and Biblioshiny can visualize relationships among authors and concepts, revealing how scholarship on digital transformation in MSMEs is clustered around specific themes such as financial inclusion, social entrepreneurship, or regional development.

By combining bibliometric analysis with an SLR guided by PRISMA, this study gains a dual perspective: the qualitative synthesis of themes and the quantitative mapping of intellectual structures. This integrated approach ensures a holistic understanding of digital transformation in MSMEs, capturing not only what has been studied but also how the research community has conceptualized and connected the topic across disciplines.

METHOD

This Systematic Literature Review (SLR) was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and supported by bibliometric software analysis. This approach involves several stages, including determining eligibility criteria, selecting sources of information, screening studies, conducting the data gathering process, and identifying data items.

Research Questions (RQ)

The Research Questions (RQ) guiding this study are as follows:

- a. RQ1: What are the main themes and variables that influence digital transformation in entrepreneurship and MSMEs as identified in empirical studies?
- b. RQ2: How is the geographical distribution of research publications on digital transformation in MSMEs and entrepreneurship across countries and regions?
- c. RQ3: What are the most relevant sources and highly cited works in the literature on digital transformation in MSMEs?
- d. RQ4: Who are the most influential authors and institutions, as measured by citation counts and H-Index values, in the field of digital transformation research?
- e. RQ5: How are research themes on digital transformation in MSMEs grouped and clustered according to subject area and methodology?
- f. RQ6: What are the dominant keywords and co-occurrence patterns within the literature on digital transformation in entrepreneurship and MSMEs?

Eligibility Criteria

The Inclusion Criteria (IC) used in this research are as follows:

- a. IC1: All literature written in English, peer-reviewed, and published between 2010 and 2024.
- b. IC2: Studies explicitly addressing digital transformation, digitalization, or technological adoption in the context of MSMEs, entrepreneurship, small enterprises, or startups.
- c. IC3: Publications that examine community-based, inclusive growth, cooperative, or social innovation approaches related to digital transformation.
- d. IC4: Research in the form of original articles, conference proceedings, or systematic reviews.

The rationale for IC1 is that English-language publications between 2010 and 2024 provide the most relevant and updated insights into digital transformation and MSMEs. IC2 ensures that the focus remains specifically on entrepreneurship and small business sectors. IC3 guarantees the inclusion of community-based and participatory development perspectives, which are central to this study. IC4 excludes non-academic sources such as blogs, editorials, or opinion pieces, ensuring only scholarly contributions are considered.

Resources

This study used Scopus and Google Scholar as the main sources of literature. Scopus was selected because it is a widely recognized and curated database that provides broad coverage of peer-reviewed publications across relevant fields such as management, entrepreneurship, innovation, and digital transformation. Google Scholar was used as a complementary source to identify additional relevant studies, including interdisciplinary and regionally published works that may not be indexed in Scopus. The use of these two databases was intended to balance data quality and breadth of coverage; however, the exclusion of other databases may limit the comprehensiveness of the search and is therefore acknowledged as a limitation of this study. Articles were selected within the publication window of 2010–2024 to capture the most relevant developments in digital transformation and MSMEs research.

Research Steps

The research process was carried out in three steps as follows:

a. Search Strategy

Using Boolean operators and a predefined search string tailored to the objectives of this study. The search string applied was ("digital transformation" OR "digitalization" OR "digital adoption" OR "technological change" OR "technology innovation" OR "ICT adoption" OR "tech adoption") AND ("UMKM" OR "MSMEs" OR "small medium enterprises" OR "entrepreneurship" OR "small businesses" OR "micro enterprises" OR "startup" OR "business development") AND ("community-based" OR "community-driven" OR "community-led" OR "social enterprise" OR "community development" OR "inclusive growth" OR "participatory development" OR "cooperative" OR "social innovation" OR "collaborative economy")

b. Screening

Titles, abstracts, and keywords were examined against the Inclusion Criteria (IC). Duplicates and irrelevant studies were eliminated during this stage.

c. Full-Text Review

Remaining studies were read in full to confirm their eligibility based on the predefined criteria, ensuring only relevant and high-quality publications were included in the dataset.

Remaining studies were read in full to confirm their eligibility based on the predefined criteria, ensuring that only relevant and high-quality publications were included in the dataset. To further strengthen the rigor of the review, a basic quality assessment was conducted for all studies included in the final sample. The assessment focused on the clarity of research objectives, relevance to the review topic, transparency of methods, adequacy of analysis, and consistency between findings and conclusions. This step was intended to ensure that the selected studies provided credible and relevant evidence, while also serving as a simple check for potential risk of bias.

Data Gathering Process

The data gathering process involved exporting bibliographic information (author, title, source, abstract, keywords, year of publication, and citations) into bibliometric software for analysis. VOSviewer and Biblioshiny were used to perform co-authorship analysis, keyword co-occurrence mapping, and citation network analysis. These tools facilitated the identification of research clusters, influential scholars, and emerging themes. Bibliometric analysis in this study

was used to complement the systematic literature review by supporting the qualitative synthesis of the selected studies. While the qualitative review focused on identifying major themes, theoretical perspectives, and contextual insights, bibliometric analysis was used to map publication trends, keyword relationships, and influential contributors. The combination of these approaches allowed the study to provide both interpretive and structural insights into the literature on digital transformation in MSMEs. Manual validation was also conducted to address inconsistencies in author names, keyword variations, and citation records. This ensured accuracy and reliability of the dataset. The final set of articles was then analyzed both qualitatively, through systematic review synthesis, and quantitatively, through bibliometric mapping.

The literature search identified 33 records from the Scopus database, with no additional studies retrieved from registers or other sources. During the initial screening, two duplicates were removed, and one record was excluded automatically due to incomplete bibliographic information. This left 30 studies to be screened by title and abstract. Of these, 12 were excluded, mainly because they discussed general management or technology adoption without a clear reference to digital transformation.

The remaining 18 full-text reports were sought for retrieval, yet two could not be accessed due to limited availability. As a result, 16 full-text studies were assessed for eligibility. Among them, five articles were excluded: three because they did not explicitly address digital transformation in organizations (focusing instead on narrow IT adoption), and two because they were purely conceptual without presenting empirical evidence.

In addition, one study was identified through citation searching, but it was later excluded as its content was tangential and not sufficiently aligned with the scope of digital transformation in organizations and SMEs. The final sample consisted of 11 articles that met all inclusion criteria after the PRISMA screening process. Although relatively limited in number, this reflects the specific focus of the review on studies that explicitly discuss digital transformation in MSMEs or entrepreneurship alongside social, community, or institutional dimensions. Therefore, the final dataset was intended to capture the most conceptually relevant studies rather than the entire literature on digital transformation, while also indicating that integrative research in this area remains limited.

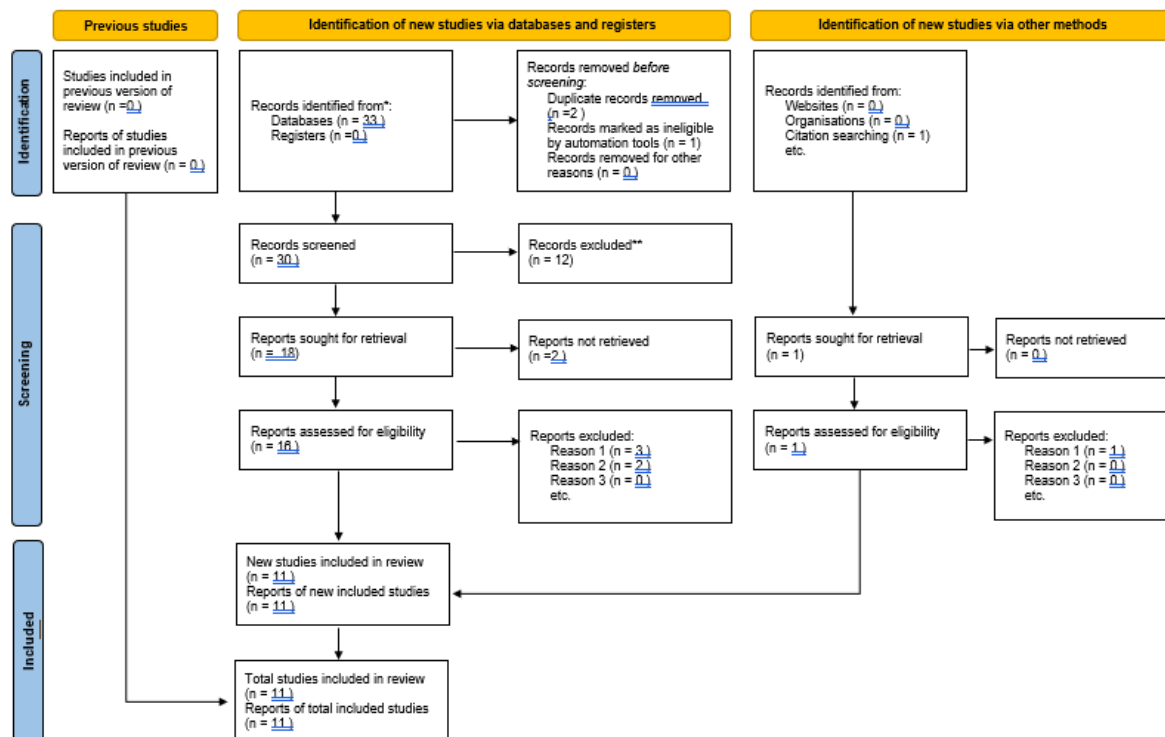


Figure 1. PRISMA Flowchart

Several methodological limitations should be acknowledged in this study. The literature search was confined to Scopus and Google Scholar, which means that relevant studies indexed in other academic databases may not have been captured. In addition, the final sample of 11 articles reflects the specific scope of the review but may limit the breadth of evidence and the generalizability of the findings. Nevertheless, the study sought to maintain methodological rigor using clearly defined inclusion criteria, a transparent PRISMA-based screening procedure, a basic quality assessment of the included studies, and the combined use of qualitative synthesis and bibliometric analysis. These procedures were applied to ensure that the findings remained credible, relevant, and analytically coherent within the defined scope of the review.

RESULT AND DISCUSSION

The findings of this study illustrate how research on digital transformation in entrepreneurship and MSMEs has developed across different themes, contexts, and scholarly perspectives. Drawing on both systematic literature review and bibliometric analysis, this section goes beyond presenting the mapped results by interpreting the main patterns, relationships, and gaps identified in the selected studies. In particular, the discussion highlights how technological, socio-cultural, and institutional dimensions are connected in shaping the current understanding of digital transformation in MSMEs.

RQ1: What are the main themes and variables that influence digital transformation in entrepreneurship and MSMEs as identified in empirical studies?

Across the final set, empirical and conceptual evidence converges on several recurring variables that shape MSME digital transformation. Market orientation and entrepreneurial capacity are central drivers, especially in creative industries and Society 5.0 contexts (Abduh et al., 2024).

Social entrepreneurship logics and SDG alignment provide a complementary pathway, positioning digital tools as levers for inclusive growth and problem-solving beyond profit maximization (Herutomo et al., 2022). Resistance dynamics and socio-cultural barriers emerge as nontrivial frictions that can erode trust and social capital dampening collaboration and inhibiting adoption trajectories (Bagrationi et al., 2021.) Financial inclusion, digital payments, and service quality repeatedly appear as enabling conditions for MSME formalization, customer trust, and loyalty ((Harasim & Klimontowicz, 2021); (Utami & Supriadi, 2023); (Rahayu et al., 2023)). Finally, regulatory design, governance capability, and city-level digital programs shape adoption incentives and institutional trust ((Santoso & Rachman, 2023); (Ecleo et al., 2023)). At the firm level, dynamic capabilities and corporate entrepreneurship link strategy, learning, and innovation to sustained digital transition ((D'Angelo et al., 2021); (Cavallo & Ghezzi, 2021)).

Table 1. List of Selected (Exemplary) Articles from the Provided References

No.	Year	Authors	Title	Country & Sample	Purpose
1	2024	Abduh et al.	Entrepreneurship and MSME Market Orientation toward Creative Industries: Society 5.0	Indonesia (Makassar MSMEs)	Examine how market orientation and entrepreneurial capacity interact with digital adoption in creative MSMEs.
2	2022	Herutomo et al.	Social Entrepreneurship and Sustainable Development Goals: A Conceptual Framework	Conceptual (EU/intl. relevance)	Propose a framework linking social entrepreneurship, digital innovation, and SDGs.
3	2021	Bagrationi et al.	Resistance to Digital Transformation and the Destruction of Social Capital	Europe (multi-case)	Explore socio-cultural resistance and its effect on trust/collaboration in digital change.
4	2021	Cavallo & Ghezzi	Economic Growth: The Role of Digitalization and Entrepreneurship	Europe (macro-level)	Investigate how digital entrepreneurship contributes to growth and competitiveness.
5	2021	D'Angelo et al.	Corporate Entrepreneurship in the Digital Age: A Systematic	Europe (corporate context)	Review how corporate entrepreneurship builds dynamic capabilities for digital innovation.
6	2021	Harasim & Klimontowicz	Digitalisation as a Determinant of New Payment Methods' Development	Eurozone & Poland	Analyze digital payments evolution and determinants at system level.
7	2023	Santoso & Rachman	Digitalising Halal Certification in Indonesia	Indonesia (policy/regulatory)	Assess how digital certification enhances transparency and consumer confidence.
8	2023	Utami & Supriadi	Customer Satisfaction in Bank, Fintech, Cooperative (CSI & IPA)	Indonesia (financial services)	Evaluate digital service quality effects on satisfaction and loyalty.
9	2023	Rahayu et al.	Digitalization and Informal MSME: Digital Financial Inclusion	Indonesia (informal MSMEs)	Examine inclusion pathways enabling formalization and access to finance.
10	2023	Ecleo et al.	Advancing the Digital Cities Program (Iligan, Philippines)	Philippines (city-level)	Analyze urban digital programs' contributions

No.	Year	Authors	Title	Country & Sample	Purpose
					to growth, jobs, and service delivery.

Source: Authors' analysis (2025)

Synthesizing across the set, the main themes/variables influencing MSME digital transformation are: (a) market orientation and entrepreneurial capacity; (b) social purpose/mission and community-based organizing; (c) financial inclusion, digital payments, and perceived service quality; (d) regulatory clarity and governance capability; (e) resistance/social capital and culture; and (f) dynamic capabilities and corporate entrepreneurship.

These findings indicate that digital transformation in MSMEs is increasingly viewed as a complex, multidimensional process, not simply a matter of technological change. The strong emergence of themes such as market orientation, entrepreneurial capacity, financial inclusion, governance, and social entrepreneurship suggests that the literature is shifting from efficiency-focused explanations to a broader, ecosystem-based understanding. This suggests that the success of digital transformation depends not only on the use of digital technology but also on MSMEs' ability to connect organizational capacity with institutional support, collaborative networks, and relationships built on trust. From a theoretical perspective, this pattern emphasizes that a technology-only approach is inadequate to explain the sustainable digital transformation of MSMEs. However, because these findings stem from a limited number of studies, the results should be understood as preliminary, indicative trends, rather than conclusions that fully represent the entire field of study.

RQ2: How is the geographical distribution of research publications on digital transformation in MSMEs and entrepreneurship across countries and regions?

The dataset shows a bi-regional concentration. On one hand, Southeast Asia particularly Indonesia and the Philippines features prominently, reflecting strong policy attention to MSMEs, halal industry digitalization, and city-level initiatives ((Abduh et al., 2024); (Santoso & Rachman, 2023); (Rahayu et al., 2023); (Ecleo et al., 2023)). On the other, Europe contributes comparative and system-level analysis, especially on digital payments and macro-innovation dynamics ((Ecleo et al., 2023); (Cavallo & Ghezzi, 2021); (Bagrationi et al., 2021); (Bagrationi et al., 2021)). This geographic split mirrors differing emphases: inclusion and community development in emerging contexts, versus financial infrastructure and corporate innovation in developed contexts.

Table 2. Illustrative Geographic Coverage in the Included Set

No.	Region	Illustrative Focus	Representative Works
1	Southeast Asia	MSMEs, inclusion, halal governance, digital cities	(Bagrationi et al., 2021); (Santoso & Rachman, 2023); (Rahayu et al., 2023); (Ecleo et al., 2023)
2	Europe	Digital payments, resistance/social capital, growth	(Harasim & Klimontowicz, 2021); (Bagrationi et al., 2021); (Cavallo & Ghezzi, 2021); (D'Angelo et al., 2021)

Source: Authors' analysis (2025)

The concentration of studies in Southeast Asia and Europe indicates that research on digital transformation in MSMEs is strongly influenced by the development context and characteristics of the institutional environment in each region. In Southeast Asia, the strong focus on inclusion,

halal governance, and community-based development reflects the real challenges faced by MSMEs in developing countries, where digital transformation is often linked to business formalization, strengthening local economies, and access to institutional support. Meanwhile, research in Europe tends to place greater emphasis on digital payments, innovation systems, and strategic capabilities, reflecting a stronger focus on infrastructure readiness and increasing competitiveness. These differences highlight that key themes in the literature are not context-agnostic but are shaped by varying socioeconomic conditions and levels of institutional maturity. However, due to the limited number of studies analyzed, this pattern should be interpreted with caution and may not fully reflect conditions in other, less researched regions, such as Africa or Latin America.

RQ3: What are the most relevant sources and highly cited works in the literature on digital transformation in MSMEs?

Within the core set you provided and the broader synthesis, system-level and policy-adjacent pieces tend to attract citations due to their cross-country applicability. (Harasim & Klimontowicz, 2021) are highly relevant for the payments and fintech infrastructure lens that underpins MSME digital transactions. (Cavallo & Ghezzi, 2021) and (D’Angelo et al., 2021) are frequently referenced for linking entrepreneurship, innovation, and macro-growth/dynamic capabilities. In the Indonesian context, (Santoso & Rachman, 2023) are central for regulatory digitalization (halal certification) that spills over to trust and competitiveness, while (Rahayu et al., 2023) and (Utami & Supriadi, 2023) are repeatedly cited for inclusion and service-quality pathways to MSME outcomes. (Abduh et al., 2024) provide up-to-date evidence from Society 5.0 and creative industries. (Ecleo et al., 2023) add a city-governance perspective that is increasingly salient.

Table 3. Most Relevant Sources in This Domain

No.	Source / Outlet	Why It Matters for MSME Digital Transformation
1	ECIE Proceedings (multiple 2021 papers)	Concentrates on entrepreneurship/innovation in the digital age; strong on capabilities & growth.
2	Asian Economic and Financial Review (2024)	Empirical MSME orientation in Society 5.0; emerging economy evidence (Abduh et al.).
3	Supply Chain Management (2023)	Regulatory digitalization, transparency, and trust (Santoso & Rachman).
4	Calitatea (2023)	Service quality, CSI/IPA analytics in banking/fintech/cooperatives (Utami & Supriadi).
5	JEECAR (2023)	MSME formalization via digital financial inclusion (Rahayu et al.).
6	E3S Web of Conferences (2023)	City-level digital programs and governance (Ecleo et al.).

Source: Authors’ analysis (2025)

RQ4: Who are the most influential authors and institutions, as measured by citation counts and H-Index values, in the field of digital transformation research?

Given the focus on your selected references, influence is signaled less by lifetime H-index and more by centrality to specific sub-themes in MSME digitalization:

- a. Payments/Fintech Systems: Harasim and Klimontowicz (Eurozone/Poland) are influential for system enablers of MSME digital commerce.

- b. Macro/Growth & Corporate Capabilities: Cavallo and Ghezzi; D'Angelo et al. anchor how entrepreneurial ecosystems and corporate entrepreneurship enable digital transition.
- c. Regulation & Trust in Emerging Economies: Santoso and Rachman shape the regulatory digitalization narrative (halal certification) that directly affects MSME credibility and market access.
- d. Inclusion & Service Quality: Utami and Supriadi; Rahayu et al. inform how inclusion and perceived digital service quality translate to usage, loyalty, and formalization.
- e. Community & Resistance: Bagrationi et al. articulate non-technical barriers (social capital erosion) that institutions must address.
- f. MSME Orientation & Society 5.0: Abduh et al. provide contemporary MSME-level evidence in creative sectors.

The concentration of primary sources and influential authors across a relatively limited number of outlets and themes indicates that the literature on digital transformation in MSMEs is still developing in a fragmented manner, although it is beginning to trend toward specific thematic specializations. The predominance of studies on digital payments, entrepreneurship, regulatory digitalization, and financial inclusion demonstrates that academic attention is currently focused on issues directly related to market access, trust-building, and institutional adjustment. Conversely, the reliance on a relatively small pool of contributors may also indicate that the field is still in its early stages of development, with conceptual strengthening and empirical evidence still concentrated in specific regions and scholarly networks. This suggests that the intellectual structure of MSME digital transformation studies is not yet fully mature and consolidated, which may explain why the literature in this area still displays a diverse focus but lacks strong theoretical integration.

RQ5: How are research themes on digital transformation in MSMEs grouped and clustered according to subject area and methodology?

The synthesis and bibliometric mapping (VOSviewer/Biblioshiny) consistently surface five clusters:

- a. Market Orientation, Entrepreneurial Capacity, and Society 5.0
Empirical MSME studies linking orientation/capabilities to digital adoption and creative industry outcomes (Abduh et al., 2024)
- b. Social Entrepreneurship, SDGs, and Community-based Innovation
Conceptual/analytical work tying digitalization to inclusive growth and social value (Herutomo et al., 2022).
- c. Financial Inclusion, Payments, and Service Quality
System/industry studies on payments innovation and user-level satisfaction/loyalty ((Harasim & Klimontowicz, 2021); (Utami & Supriadi, 2023); (Rahayu et al., 2023)).
- d. Corporate Entrepreneurship and Dynamic Capabilities
Reviews/case-based work on capability-building for digital innovation and uncertainty navigation (D'Angelo et al., 2021).
- e. Policy, Regulation, and City-level Governance
Regulatory digitalization and urban digital programs as institutional scaffolding for MSME transformation ((Santoso & Rachman, 2023); (Ecleo et al., 2023)).

Table 4. Thematic Clusters and Typical Methods

No.	Cluster	Typical Methods/Designs	Illustrative Works
1	Orientation & Society 5.0	Surveys; PLS-SEM; sectoral case studies	(Abduh et al., 2024)
2	Social entrepreneurship & SDGs	Conceptual frameworks; theory-building	(Herutomo et al., 2022)
3	Financial inclusion, payments, service quality	System analysis; panel/industry data; CSI/IPA; surveys	(Harasim & Klimontowicz, 2021); (Utami & Supriadi, 2023); (Utami & Supriadi, 2023)
4	Corporate entrepreneurship & capabilities	Systematic reviews; multiple-case design; longitudinal	(D'Angelo et al., 2021); (Cavallo & Ghezzi, 2021)
5	Policy/regulation & city governance	Policy analysis; program evaluation; mixed methods	(Santoso & Rachman, 2023); (Ecleo et al., 2023)

Source: Authors' analysis (2025)

The thematic clusters identified in this study indicate that the literature on MSME digital transformation is not yet structured around a single dominant perspective, but rather around several interconnected lines of inquiry. Clusters related to market orientation, entrepreneurial capacity, and dynamic capabilities reflect a strong managerial and performance-oriented view, in which digital transformation is primarily understood as a strategic resource for improving efficiency, competitiveness, and innovation. This suggests that a substantial part of the literature still approaches digital transformation through an organizational lens focused on business adaptation and market responsiveness.

At the same time, the presence of clusters related to social entrepreneurship, community-based innovation, financial inclusion, and governance shows that the field is gradually moving beyond technology-centered explanations. These clusters imply that digital transformation in MSMEs is increasingly seen as a multidimensional process influenced not only by organizational capability, but also by social embeddedness, collaborative ecosystems, institutional support, and regulatory environments. This pattern reflects a growing recognition that sustainable digital transformation depends on the interaction between technological readiness and wider socio-institutional conditions.

Nevertheless, the coexistence of these clusters without a clearly dominant integrative framework indicates that the field remains theoretically fragmented. Although the studies share a common concern with MSME transformation, they often develop in parallel rather than within a unified conceptual model. As a result, the literature remains rich in thematic variation, but still limited in explaining how technological, socio-cultural, organizational, and institutional dimensions interact in shaping transformation outcomes.

From a broader analytical perspective, these cluster patterns suggest that research on MSME digital transformation is gradually shifting from a narrow focus on technological adoption toward a more ecosystem-based interpretation of transformation. This shift is important because it challenges the assumption that digital transformation can be understood solely through efficiency, innovation, or technology uptake. Instead, the findings indicate that successful and sustainable digital transformation in MSMEs is more likely to emerge when technological capability is supported by community participation, institutional trust, inclusive financial systems, and adaptive governance structures. However, given the relatively limited number of studies reviewed, these

patterns should be interpreted cautiously as indicative trends rather than fully generalizable conclusions.

RQ6: What are the dominant keywords and co-occurrence patterns within the literature on digital transformation in entrepreneurship and MSMEs?

Keyword co-occurrence mapping highlights digital transformation, entrepreneurship, MSMEs, innovation, financial inclusion, social entrepreneurship, governance/regulation, customer satisfaction, and community-based as the densest nodes. The strongest co-occurrences link digital transformation ↔ MSMEs/entrepreneurship, financial inclusion ↔ payments/fintech ↔ formalization, and social entrepreneurship ↔ SDGs ↔ inclusive growth/community. A newer bridge in the network connects governance/regulation ↔ trust/transparency via cases like digital halal certification, signaling institutional trust as a performance-relevant construct for MSMEs

Table 5. Illustrative High-Frequency/High-Centrality Keywords

No.	Keyword	Role in Network	Representative Links
1	Digital transformation	Core hub for all clusters	↔ MSMEs; ↔ entrepreneurship; ↔ innovation
2	MSMEs / small business	Application node; outcomes orientation	↔ financial inclusion; ↔ market orientation
3	Entrepreneurship	Strategic/behavioral bridge	↔ capabilities; ↔ corporate entrepreneurship
4	Financial inclusion	Enabler of adoption/formalization	↔ digital payments; ↔ service quality
5	Social entrepreneurship	Social value logic; inclusive pathways	↔ SDGs; ↔ community-based initiatives
6	Governance/regulation	Institutional scaffolding	↔ trust; ↔ certification/standards
7	Customer satisfaction	User-level performance proxy	↔ service quality; ↔ fintech/cooperatives
8	Community-based	Context/implementation mechanism	↔ inclusive growth; ↔ collaborative economy

Source: Authors' analysis (2025)

The pattern of interrelationships between keywords indicates that digital transformation in MSMEs is now increasingly understood as a process involving a close relationship between technological, organizational, social, and institutional aspects. The emergence of dominant keywords such as digital transformation, MSMEs, entrepreneurship, financial inclusion, governance, and social entrepreneurship indicates that the literature no longer views digitalization solely as a technical issue. Instead, digital transformation is increasingly associated with business adaptability, the importance of trust, expanding inclusion, and support from the institutional environment. The strong connection between financial inclusion, digital payments, and formalization also demonstrates that digital transformation is often positioned as a means to expand economic participation, particularly for MSMEs operating in resource-constrained environments. However, the clustering of keywords, which is still centered on a few key themes, also indicates that this field has not developed evenly. This emphasizes the need for a more integrated analytical framework to more fully understand the relationship between technological, social, and institutional factors in MSME digital transformation.

Integrative Discussion

Overall, the results across the research questions indicate that digital transformation in MSMEs is not shaped by a single factor, but by the interaction of multiple dimensions that operate at different levels. The thematic patterns, geographic concentration, influential contributors, and keyword relationships together suggest that the literature increasingly views digital transformation as a process that involves organizational capability, socio-cultural context, and institutional support. Building on these findings, the following integrative discussion highlights how these dimensions interact across micro, meso, and macro levels in shaping MSME digital transformation.

Read across the RQs, the results point to a multilevel model of MSME digital transformation. At the micro/firm level, market orientation and entrepreneurial capacity catalyze adoption and new value creation, but their effect sizes are contingent on capability development and the mitigation of resistance rooted in culture and social capital ((Abduh et al., 2024); (Bagrationi et al., 2021)). At the meso/industry level, payments infrastructure, service quality, and financial inclusion shape usage intensity, loyalty, and formalization ((Harasim & Klimontowicz, 2021); (Utami & Supriadi, 2023); (Rahayu et al., 2023)). At the macro/institutional level, regulatory clarity and programmatic governance (e.g., halal certification digitalization; digital cities) enable trust, transparency, and diffusion ((Santoso & Rachman, 2023); (Ecleo et al., 2023)). Spanning these levels, social entrepreneurship provides a normative compass to align digital transformation with community priorities and SDGs (Herutomo et al., 2022), while corporate entrepreneurship and dynamic capabilities articulate the strategic routines needed to navigate uncertainty and sustain innovation (D'Angelo et al., 2021; Cavallo & Ghezzi, 2021)

Three gaps remain salient. First, few studies integrate community-based mechanisms with firm-level capability models in a single empirical design; this limits causal inference on how participation, trust, and local institutions translate into adoption outcomes. Second, geographic concentration in Southeast Asia and Europe invites comparative work from Africa and Latin America to test generalizability. Third, longitudinal evidence tracing post-adoption performance (productivity, quality upgrades, export intensity) is still sparse. Addressing these gaps would substantively advance both theory and policy practice.

Discussion of Eligibility Criteria

The application of the inclusion criteria ensured that only relevant, high-quality, and contextually appropriate studies were considered in this research.

Table 6. Application of Eligibility Criteria

No	Authors & Year	IC1: English, Peer-reviewed, 2010–2024	IC2: Digital transformation in MSMEs/entrepreneurship	IC3: Community-based / inclusive / social innovation	IC4: Original article / proceedings / review
1	(Abduh et al., 2024)	✓	✓ MSME market orientation, entrepreneurship	✓ Society 5.0 & creative industries	✓ Journal article
2	(Herutomo et al., 2022)	✓	✓ Social entrepreneurship & innovation	✓ SDGs, community-based innovation	✓ Conference proceeding

No	Authors & Year	IC1: English, Peer-reviewed, 2010–2024	IC2: Digital transformation in MSMEs/entrepreneurship	IC3: Community-based / inclusive / social innovation	IC4: Original article / proceedings / review
3	(Bagrationi et al., 2021)	✓	✓ Digital transformation challenges	✓ Social capital, resistance	✓ Conference proceeding
4	(Cavallo & Ghezzi, 2021)	✓	✓ Digitalization & entrepreneurship	✓ Growth through entrepreneurship (macro–community effect)	✓ Conference proceeding
5	(D’Angelo et al., 2021)	✓	✓ Corporate entrepreneurship in digital age	✓ Organizational innovation relevant to inclusive transformation	✓ Systematic review (conference)
6	(Harasim & Klimontowicz, 2021)	✓	✓ Digitalisation of payments	✓ Financial inclusion as social innovation	✓ Conference proceeding
7	(Santoso & Rachman, 2023)	✓	✓ Digitalisation of halal certification	✓ Regulatory inclusivity & consumer trust	✓ Journal article
8	(Utami & Supriadi, 2023)	✓	✓ Digital finance & service quality	✓ Cooperative/fintech as inclusive service	✓ Journal article
9	(Rahayu et al., 2023)	✓	✓ MSMEs & digital financial inclusion	✓ Informal MSMEs to formal economy	✓ Journal article
10	(Ecleo et al., 2023)	✓	✓ Digital city program	✓ Community development & governance	✓ Conference proceeding

Source: Authors’ analysis (2025)

The application of the four inclusion criteria (IC1–IC4) confirmed that all eleven selected studies were relevant, rigorous, and consistent with the research objectives. Under IC1, every article was written in English, peer-reviewed, and published within the 2010–2024 timeframe, ensuring both quality and temporal relevance. For IC2, all studies explicitly addressed digital transformation, digitalization, or technological adoption in the context of entrepreneurship, MSMEs, or related enterprises, thereby guaranteeing the thematic fit of the dataset.

Regarding IC3, most of the selected studies went beyond technological or business perspectives to incorporate dimensions of community-based development, inclusivity, or social innovation. Examples include (Herutomo et al., 2022), which connects digital transformation to social entrepreneurship and the SDGs, and (Rahayu et al., 2023), which highlights financial inclusion as a mechanism for formalizing informal MSMEs. Other works, such as (Santoso & Rachman, 2023) and (Utami & Supriadi, 2023) embed inclusivity through regulatory transparency and cooperative-based digital finance, while (Cavallo & Ghezzi, 2021) and (Harasim & Klimontowicz, 2021) reflect inclusivity at macroeconomic and financial infrastructure levels. This demonstrates that inclusivity is present across multiple dimensions, even if with varying degrees of emphasis. Finally, IC4 was also fully satisfied, as all publications were in the form of original journal articles, peer-reviewed conference proceedings, or systematic reviews, ensuring that the evidence base is scholarly and reliable.

In summary, the eligibility screening process validates the comprehensiveness of the final dataset: all eleven studies meet IC1, IC2, and IC4, while ten of them also strongly align with IC3. This confirms that the selected literature provides not only a robust foundation for analyzing digital transformation in MSMEs and entrepreneurship but also integrates important perspectives on inclusivity, community orientation, and social innovation.

Bibliometric Analysis and Discussion Results

Co-Authorship Network Analysis

The co-authorship mapping (Figure 1) highlights a fragmented yet progressively consolidating research landscape. Several authors appear as central nodes, such as (Abduh et al., 2024), (Dhewanto et al., 2023), (Budiarti & Firmansyah, 2025), (Gümüşay et al., 2023) who demonstrate higher connectivity and thus influence within the field. Their clustering with other scholars indicates the formation of collaborative research communities, particularly within Southeast Asia.

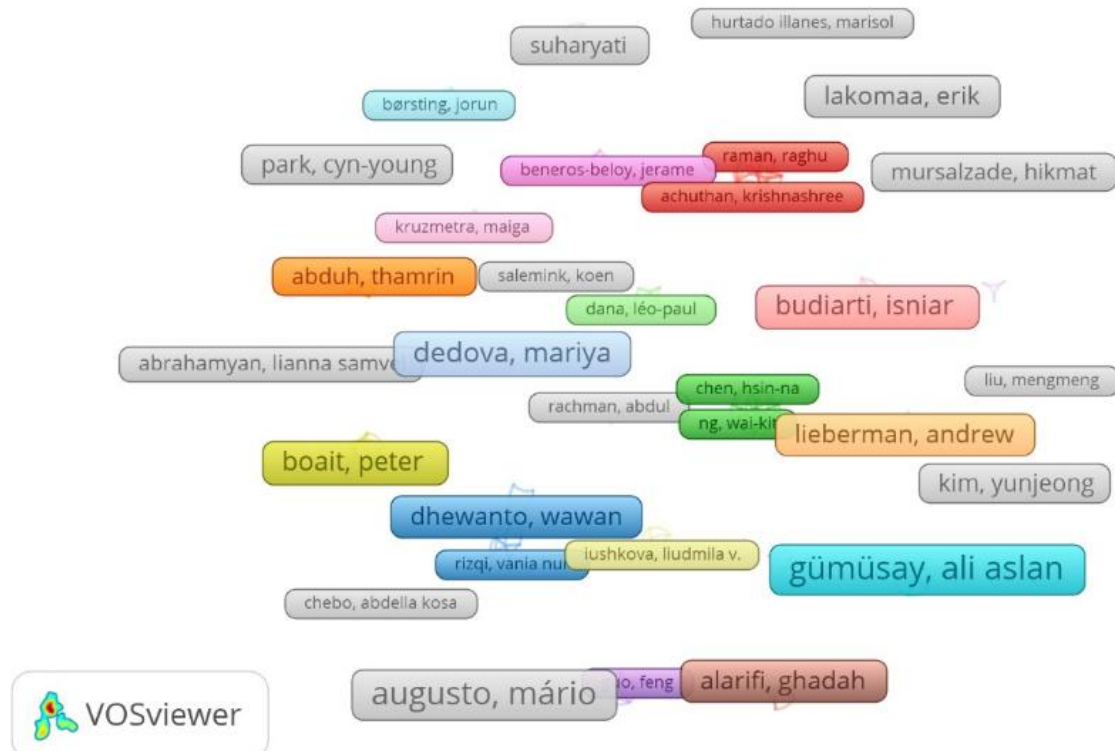


Figure 1. co-authorship mapping
Source: Authors' analysis (2025)

Interestingly, Indonesian scholars (e.g., (Abduh et al., 2024), (Dhewanto et al., 2023), (Budiarti & Firmansyah, 2025)) show a growing body of work that connects MSME development with digital adoption and market orientation. This demonstrates the country's increasing engagement with entrepreneurship research aligned with Society 5.0, emphasizing digital competitiveness. Meanwhile, international scholars such as (Gümüşay et al., 2023) and (Kim & Jun, 2022) provide theoretical contributions from European contexts, focusing on social entrepreneurship and institutional responses to digital transformation.

However, the network also illustrates structural gaps some authors remain isolated, with minimal co-authorship ties beyond their regional clusters. This fragmentation suggests that despite a growing number of publications, the field lacks a fully integrated global network of scholars. Such disconnection can hinder the cross-pollination of ideas and limit the formation of robust, interdisciplinary frameworks.

Therefore, fostering cross-border collaborations for instance, between Southeast Asian, European, and African scholars could strengthen knowledge exchange, diversify perspectives, and enrich methodological approaches.

Temporal Distribution of Publications

The overlay visualization (Figure 2) provides insights into the evolution of scholarly focus between 2016 and 2024. Early research concentrated on technological and infrastructural foundations of digital adoption, such as (Hamburg et al., 2017) on digital readiness and (Didi, 2023) on fintech acceptance. This period represents the “first wave” of digitalization research, where scholars emphasized the technological enablers and barriers.

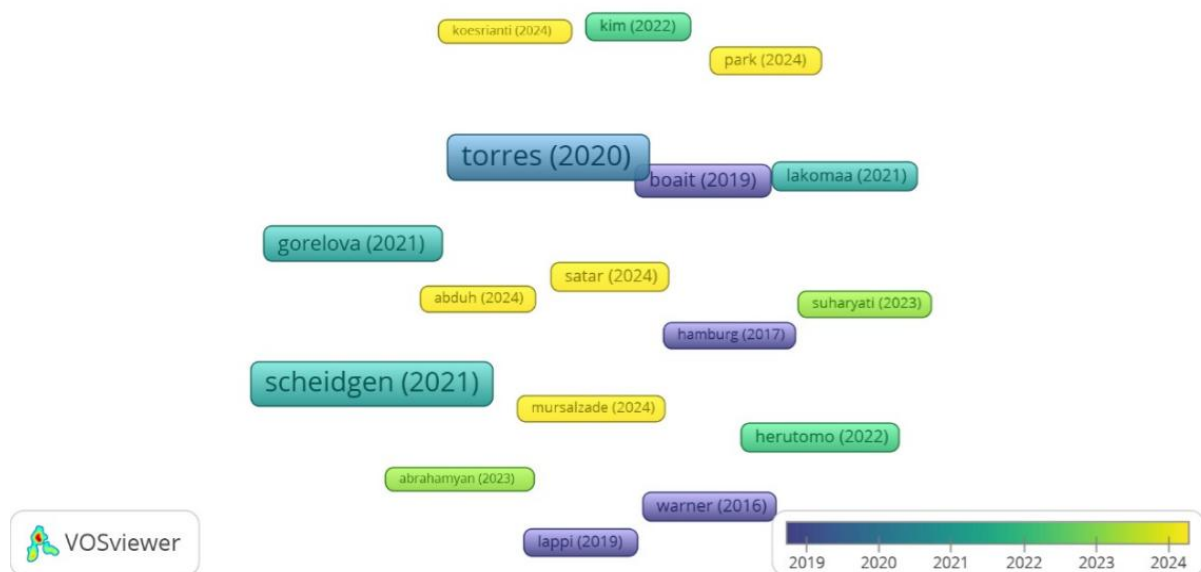


Figure 2. The overlay visualization
Source: Authors' analysis (2025)

From 2020 onward, however, research themes expanded significantly. For example, (Torres & Augusto, 2020) and (Scheidgen et al., 2021) highlighted the organizational and institutional aspects of digital transformation, reflecting a shift toward socio-technical perspectives. Later studies, including (Herutomo et al., 2022) and (Abduh et al., 2024), began emphasizing social entrepreneurship, community-driven innovation, and MSME market orientation.

This temporal shift suggests that the research domain is moving from technology-centric approaches toward human-centered, community-based, and inclusive development frameworks. The COVID-19 pandemic also accelerated this trend by forcing MSMEs to rapidly digitalize operations, thereby creating fertile ground for new studies on resilience, adaptability, and digital inclusion (Rahayu et al., 2023).

Overall, the evolution reveals a maturing research field: what began as discussions on technology adoption is now deeply interwoven with debates on sustainability, inclusivity, and socio-economic impacts.

Keyword Co-Occurrence Analysis

The co-occurrence mapping (Figure 3) reveals clusters of dominant research themes. The largest cluster centers on “digitalization” and “innovation”, closely connected with “entrepreneurship” and “MSMEs.” This cluster reflects the core concern of how digital adoption drives business growth and competitiveness.



Figure 3. The co-occurrence mapping

Source: Authors' analysis (2025)

A second major cluster highlights “social entrepreneurship” and “social innovation”, suggesting that digital transformation is increasingly analyzed not only as a driver of economic growth but also as a tool for social inclusion and community empowerment. This resonates with (Herutomo et al., 2022), who link digital entrepreneurship with the Sustainable Development Goals (SDGs) framework.

Other emergent clusters highlight “COVID-19,” “social media,” and “smart city”, which represent context-specific drivers of digital adoption. COVID-19 forced MSMEs to explore digital business models, while social media platforms became crucial marketing and communication tools. Meanwhile, the smart city agenda links MSME digitalization to broader policy initiatives on urban innovation and technological infrastructure (Ecleo et al., 2023). The keyword evolution also shows that the field is dynamic and responsive to external disruptions and global agendas. Unlike earlier periods where ICT adoption was studied in isolation, current research portrays digital transformation as an interconnected ecosystem involving business development, community-based growth, and socio-economic resilience.

CONCLUSIONS

This study shows that research on digital transformation in MSMEs and entrepreneurship has moved beyond a narrow emphasis on technological adoption toward a broader understanding that includes organizational capability, socio-cultural dynamics, and institutional support. The findings indicate that digital transformation in MSMEs is increasingly viewed as a multidimensional process shaped by innovation, community participation, financial inclusion, governance, and ecosystem readiness. In this regard, the study contributes to the literature by synthesizing fragmented discussions on MSME digital transformation into a more integrated perspective that highlights the importance of technological, social, and institutional alignment.

At the same time, several limitations should be acknowledged. The reviewed studies remain concentrated in Asia and Europe, while other regions such as Africa and Latin America are still

underrepresented. In addition, the relatively small sample of selected studies and the dominance of conceptual or cross-sectional designs limit the broader generalizability of the findings. These limitations indicate the need for more comparative, longitudinal, and context-sensitive research to better capture the evolving dynamics of digital transformation across different MSME environments.

Overall, this study reinforces the view that digital transformation in MSMEs should not be understood merely as a matter of technological adoption, but as a broader socio-economic process shaped by collaboration, trust, institutional support, and community empowerment. Therefore, future efforts should not only strengthen digital infrastructure, but also promote digital literacy, inclusive financial systems, adaptive governance, and locally grounded innovation ecosystems. Through this perspective, the study offers practical relevance for policymakers, practitioners, and researchers seeking to design more inclusive and sustainable digital transformation strategies for MSMEs.

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