Bibliometric Analysis of Digital Transformation in MSME Entrepreneurship in the Era of Creative Economy

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ABSTRACT

Digital transformation has become a pivotal driver of innovation and competitiveness in micro, small, and medium enterprises (MSMEs), particularly within the creative economy. This study conducts a bibliometric analysis using Scopus as the primary data source and VOSviewer for visualization to examine the intellectual landscape of digital transformation in MSME entrepreneurship. The findings reveal that entrepreneurship, digital economy, and digital transformation are the dominant research themes, with emerging interest in sustainability, artificial intelligence, and platform-based business models. The temporal analysis highlights a shift from early studies on digital adoption and entrepreneurship education toward more recent discussions on economic development, sustainability, and innovation-driven digital ecosystems. The co-authorship and country collaboration networks indicate strong research connections among the United States, China, India, and Russia, but also reveal gaps in contributions from underrepresented regions. This study identifies key research trends, highlights knowledge gaps, and proposes future research directions, including sustainable digital entrepreneurship, ethical platform governance, and policy frameworks for inclusive digital transformation. The insights provided serve as a foundation for further academic inquiry and strategic policymaking to ensure the equitable and sustainable growth of MSMEs in the digital economy.

Keywords: Digital Transformation, MSME, Entrepreneurship, Creative Economy, Bibliometric Analysis

1. INTRODUCTION

In recent years, digital transformation has emerged as a critical force reshaping business landscape, driving innovation and altering competitive dynamics across industries. With the rapid proliferation of advanced technologies—such as cloud computing, artificial intelligence, big data analytics, and the Internet of Things—organizations are compelled to re-evaluate their business models and operational strategies to remain competitive [1]. Among these organizations, micro, small, and medium enterprises (MSMEs) have increasingly recognized the potential of digital technologies to streamline operations, expand market reach, and foster entrepreneurship. As digital tools become more accessible and affordable, MSMEs are uniquely positioned to leverage these innovations, thereby contributing to a more dynamic and inclusive economic environment [2]. In parallel, the global creative economy has provided fertile ground for integrating digital transformation into entrepreneurship, encouraging creative practices and the emergence of novel business models [3]. This convergence of digitalization and creativity sets the stage for a profound transformation in how MSMEs operate and compete on a global scale.

MSMEs play a pivotal role in economic development, contributing significantly to employment, innovation, and sustainable growth—especially in emerging markets [4]. Despite their economic importance, many MSMEs have traditionally faced constraints such as limited access to capital, insufficient technological expertise, and regulatory challenges that inhibit scalability and

competitiveness [5]. However, the ongoing trend of digital transformation is gradually mitigating these barriers by providing MSMEs with cost-effective solutions that democratize access to global markets and enhance operational efficiency. Simultaneously, the rise of the creative economy amplifies these opportunities by fostering innovative approaches that blend artistic and cultural elements with cutting-edge technology. This dynamic interplay not only revitalizes traditional business practices but also propels MSMEs toward new avenues of growth and entrepreneurship, ultimately contributing to a more resilient and adaptive economic landscape.

As the literature on digital transformation continues to expand, bibliometric analysis has emerged as a valuable methodological approach for synthesizing the vast body of research in this area. Bibliometric studies offer quantitative insights into publication trends, authorship patterns, and thematic evolutions, thereby helping researchers identify knowledge gaps and emerging trends [6], [7]. Within the context of MSME entrepreneurship, this approach can elucidate the interdisciplinary nature of digital transformation by revealing intersections among fields such as information systems, business strategy, and creative industries. Such analyses are instrumental in mapping the intellectual structure of the domain and in fostering collaborative research efforts. By examining the growth and distribution of scholarly output, bibliometric analysis also enables a critical evaluation of how digital transformation paradigms have evolved over time, providing valuable guidance for future research directions.

The era of the creative economy has witnessed a paradigm shift in the way businesses conceive innovation and competitive advantage. This shift is characterized by a growing emphasis on creativity, design, and cultural capital as integral components of business strategy (Howkins, 2001). Digital transformation plays a critical role in this context by enabling MSMEs to harness creative potential and integrate it with data-driven decision-making processes. The intersection of digital technologies and creative practices has led to the emergence of novel business models in which digital platforms serve as incubators for innovative ideas and entrepreneurial ventures. This convergence is particularly significant for MSMEs, as it allows them to compete with larger firms by capitalizing on unique niche market opportunities and by responding agilely to consumer trends. In effect, the synergy between digital transformation and the creative economy is redefining the landscape of entrepreneurship, fostering environments where innovation is both accessible and scalable.

Despite the growing body of research on digital transformation and its implications for MSMEs, a comprehensive understanding of the scholarly discourse remains fragmented. Existing studies have predominantly focused on isolated aspects of digital adoption, operational efficiency, or market expansion, often neglecting the broader implications of the creative economy on entrepreneurial dynamics. Moreover, the rapid pace of technological change and the evolving nature of digital ecosystems necessitate continuous reassessment of both theoretical frameworks and empirical findings. This fragmented literature underscores the need for an integrative approach that systematically analyzes trends, patterns, and research gaps in digital transformation within the MSME sector. A bibliometric analysis offers a robust means to address these challenges by consolidating diverse research findings and providing a clear, quantitative overview of the intellectual landscape. Such an approach is essential for guiding policymakers, practitioners, and academics in their efforts to foster digital innovation and sustainable entrepreneurial growth.

Notwithstanding the proliferation of studies on digital transformation in MSMEs, several challenges remain that hinder a cohesive understanding of the field. The existing literature is marked by disciplinary silos, with insights from information technology, business management, and creative industries often examined in isolation rather than through an integrative lens. This fragmentation results in an incomplete portrayal of how digital technologies reshape entrepreneurial practices in the era of the creative economy. Furthermore, there is a dearth of comprehensive analyses that trace the evolution of research trends and collaborative networks over time. The rapid advancement of digital technologies and the dynamic nature of creative industries exacerbate this issue, as new themes and concepts emerge at an unprecedented pace. Consequently, stakeholders—ranging from policymakers to MSME owners—face challenges in accessing consolidated, actionable knowledge that can inform strategic decisions and policy formulations, limiting the potential for holistic digital integration.

In response to these challenges, the objective of this study is to conduct a comprehensive bibliometric analysis of digital transformation in MSME entrepreneurship within the creative economy era. This study aims to map the evolution of scholarly research, identify key thematic trends, and uncover influential collaborations across disciplines. By synthesizing a diverse body of literature, the study intends to provide a robust framework that informs both academic inquiry and practical strategies. Moreover, by integrating insights from diverse fields, this study aims to create a nuanced understanding that aligns academic theories with the evolving realities of digital innovation in MSME entrepreneurship. This comprehensive analysis seeks not only to enrich academic literature but also to inform practical strategies for fostering resilient and competitive MSMEs. Ultimately, the insights derived from this analysis are expected to guide policymakers, practitioners, and researchers in fostering an ecosystem that supports digital innovation and sustainable entrepreneurial growth.

2. LITERATURE REVIEW

The rapid proliferation of digital technologies over the past decade has generated a substantial body of literature focused on digital transformation as a critical driver of organizational change and innovation. Digital transformation is broadly defined as the integration of digital technologies into every aspect of business operations, which not only alters the way companies operate but also transforms their value propositions and competitive strategies [8]. Scholars such as [9] argue that digital transformation transcends mere technological implementation; it involves a fundamental rethinking of business models, customer engagement, and internal processes. This paradigm shift is particularly relevant for micro, small, and medium enterprises (MSMEs), where resource constraints and traditional business practices often impede rapid technological adoption. The literature thus sets the stage by asserting that digital transformation, when strategically aligned with organizational vision and culture, can lead to enhanced operational efficiencies and sustainable competitive advantage.

Within the broad context of digital transformation, a significant stream of research has focused on its adoption and impact within MSMEs. These enterprises, which constitute the backbone of many economies, face unique challenges such as limited access to capital, insufficient technical expertise, and regulatory hurdles that complicate the integration of digital solutions [10], [11]. Despite these constraints, MSMEs are increasingly recognizing the potential of digital tools to

overcome traditional barriers and expand their market reach. Studies by authors like [12] have highlighted that digital technologies such as cloud computing, mobile applications, and e-commerce platforms are leveling the playing field, allowing smaller firms to compete with larger counterparts. Additionally, digital transformation enables MSMEs to optimize operations through enhanced data analytics, which supports better decision-making and agile responses to market changes. The literature consistently emphasizes that the strategic adoption of digital technologies is essential for MSMEs seeking to improve productivity, foster innovation, and secure long-term growth in a rapidly evolving economic landscape.

Parallel to the discussion on digital transformation is the burgeoning literature on the creative economy, a concept that has gained traction in recent years as economies increasingly prioritize innovation and creativity as key drivers of growth. The creative economy, defined by [13], refers to sectors that combine cultural, artistic, and intellectual inputs with technological innovation to create economic value. This approach highlights the importance of creativity, design, and cultural capital in driving entrepreneurship and competitive differentiation. Researchers have noted that the creative economy provides fertile ground for digital transformation by fostering an environment where innovation is both accessible and scalable. For MSMEs, integrating creative processes with digital technologies can lead to the development of unique products and services that resonate with niche markets. Moreover, the synergy between digital transformation and the creative economy is seen as a catalyst for reimagining traditional business models, allowing enterprises to pivot quickly in response to evolving consumer preferences and technological disruptions [14], [15].

The intersection of digital transformation and the creative economy within the MSME context has attracted considerable scholarly attention, particularly with respect to the challenges and opportunities it presents. While digital transformation provides the technical infrastructure for innovation, the creative economy contributes the cultural and intellectual capital necessary for developing novel entrepreneurial ventures. Research by scholars such as [16] suggests that the fusion of these elements can create a dynamic entrepreneurial ecosystem where creativity and technology reinforce each other. However, the literature also reveals that many MSMEs struggle to integrate these dual imperatives effectively. Barriers such as inadequate digital skills, resistance to change, and limited access to innovative networks often hinder the successful melding of digital and creative strategies [17]. Consequently, there is a growing call within the literature for comprehensive frameworks that not only address the technological aspects of digital transformation but also incorporate creative strategies that can drive sustainable entrepreneurial success.

In addressing the complexities of digital transformation in MSME entrepreneurship, researchers have increasingly turned to bibliometric analysis as a methodological tool to map the evolving scholarly landscape. Bibliometric analysis involves the quantitative assessment of research outputs, allowing scholars to identify publication trends, collaboration networks, and thematic clusters within a given field [18]. [7] highlight that bibliometric methods provide a systematic and replicable approach for synthesizing large bodies of literature, thus enabling a deeper understanding of how concepts such as digital transformation, MSME entrepreneurship, and the creative economy have evolved over time. This methodological approach is particularly valuable in fields characterized by rapid technological change and interdisciplinary research, as it helps to reveal emerging trends, intellectual gaps, and potential areas for future study. For instance, bibliometric studies have uncovered that while there is a substantial amount of research on digital transformation

in large corporations, there remains a relative paucity of studies that focus specifically on the unique contexts and challenges faced by MSMEs [7]. Such insights underscore the importance of employing bibliometric analysis to consolidate and critically evaluate existing research, thereby guiding subsequent empirical and theoretical investigations.

Despite the rich insights offered by individual studies on digital transformation, MSME entrepreneurship, and the creative economy, the literature reveals several critical gaps. First, much of the existing research tends to examine these domains in isolation rather than as interconnected phenomena. This disciplinary silos approach limits our understanding of how digital technologies and creative processes jointly influence entrepreneurial outcomes in MSMEs. Second, the rapid pace of technological change means that many studies quickly become outdated, underscoring the need for continuous reassessment of theoretical frameworks and empirical findings. Moreover, the limited number of integrative studies that apply bibliometric methods to this intersection highlights the necessity for research that can synthesize diverse strands of literature into a cohesive analytical framework. By addressing these gaps, future research can provide a more nuanced understanding of how digital transformation, when coupled with creative strategies, can drive innovation and competitiveness in the MSME sector.

3. METHODS

This study employs a bibliometric analysis approach using data exclusively from the Scopus database and utilizes VOSviewer as the sole analytical tool. Data was retrieved from Scopus through a targeted search strategy using keywords such as "digital transformation," "MSME entrepreneurship," and "creative economy" to capture a comprehensive set of relevant publications. The inclusion criteria were confined to peer-reviewed journal articles and conference proceedings published in English over the past two decades, ensuring the dataset reflects high-quality and influential works within the field. Following data extraction, a rigorous cleaning process was undertaken to eliminate duplicates and standardize author names, thereby enhancing the reliability of the analysis. VOSviewer was then applied to generate visual representations of the data, including co-authorship networks, citation analyses, and keyword co-occurrence maps.

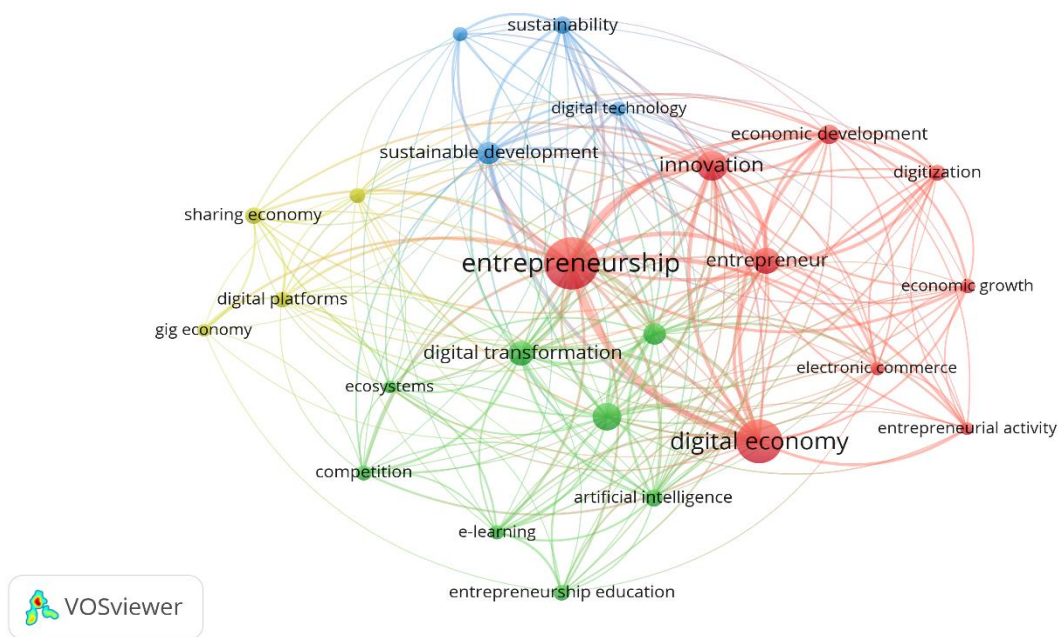## 4. RESULTS AND DISCUSSION
4.1 Network Visualization

Figure 1. Network Visualization
Source: Data Analysis Result, 2025

The visualization presents a network analysis of key terms related to digital transformation, MSME entrepreneurship, and the creative economy, as derived from Scopus-indexed literature. The visualization categorizes keywords into distinct clusters, each represented by different colors, indicating thematic associations and research interconnections. The largest and most central nodes—entrepreneurship, digital economy, and digital transformation—highlight the core focus of the research landscape. These terms serve as major conceptual anchors, linking various subtopics that provide insight into the evolving discourse on digital transformation in entrepreneurial contexts.

The red cluster, centered around entrepreneurship and digital economy, encapsulates themes related to economic development, innovation, and digitalization. The strong interconnections within this cluster suggest that research on digital transformation is heavily linked to broader economic phenomena such as economic growth, e-commerce, and entrepreneurial activity. The emphasis on innovation within this cluster underscores the role of digital tools in reshaping traditional business practices and creating new opportunities for entrepreneurial ventures. This cluster also reflects the increasing recognition of digital entrepreneurship as a key driver of modernization in both developed and emerging economies.

The green cluster, prominently featuring digital transformation, includes key terms such as artificial intelligence, ecosystems, e-learning, competition, and entrepreneurship education. This cluster signifies the technological and educational dimensions of digital transformation, emphasizing how digital technologies reshape business environments and entrepreneurial competencies. The presence of artificial intelligence and e-learning suggests an ongoing academic interest in how emerging technologies contribute to skill development and knowledge dissemination in the entrepreneurial landscape. Additionally, ecosystems and competition indicate that digital transformation is not only an internal business concern but also a factor influencing broader market structures and industry dynamics.

The blue cluster, which revolves around sustainability, digital technology, and sustainable development, highlights the intersection of digital transformation with sustainability and environmental considerations. The inclusion of sustainability suggests that scholars are increasingly examining how digital transformation impacts sustainable business practices, particularly within

MSMEs. The connection between digital technology and sustainable development indicates that digitalization is being explored not only as a tool for economic growth but also as a mechanism for fostering environmentally responsible entrepreneurship. This aligns with contemporary discussions on the role of digital solutions in promoting green innovation and responsible business strategies.

The yellow cluster, which contains sharing economy, digital platforms, and gig economy, represents emerging business models facilitated by digital transformation. The presence of sharing economy and gig economy suggests that digitalization is driving new forms of entrepreneurship that rely on platform-based and decentralized business structures. The interconnectedness of these terms with digital platforms indicates that much of the research in this domain focuses on how digital technologies enable novel business models, particularly in the MSME sector. This highlights the increasing importance of platform-based businesses, such as freelance marketplaces and peer-to-peer services, in the evolving entrepreneurial ecosystem.
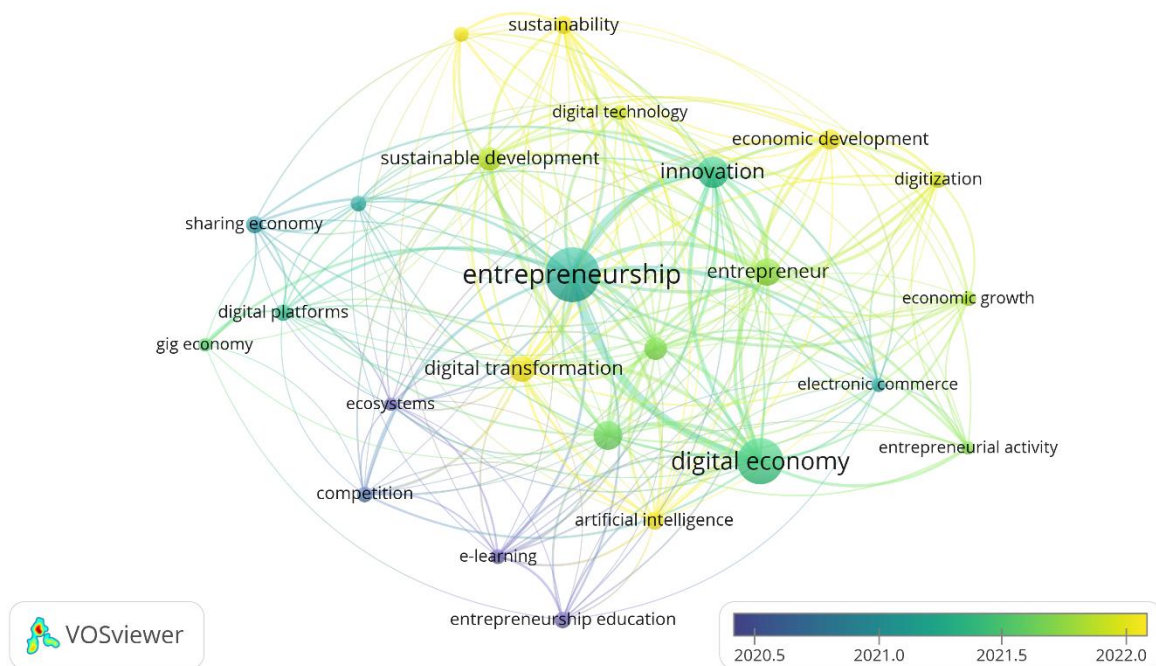

Figure 2. Overlay Visualization
Source: Data Analysis Result, 2025

The visualization presents a temporal analysis of research trends related to digital transformation in MSME entrepreneurship within the era of the creative economy, using a color gradient that ranges from blue (older research, around 2020) to yellow (more recent research, closer to 2022). The central terms—entrepreneurship, digital economy, and digital transformation—remain key thematic pillars, with strong interconnections to various subtopics. The color gradient shows that earlier research (depicted in blue and green) focused on digital transformation, entrepreneurship education, artificial intelligence, and ecosystems, indicating that the initial discussions revolved around technological adoption, digital learning, and competitive business environments. Over time, these themes evolved into more recent areas of interest, particularly concerning innovation, economic development, and sustainability, which are highlighted in yellow.

One of the notable trends in the visualization is the increasing academic focus on sustainability and digital technology, as these terms appear in the yellow-to-green spectrum, indicating more recent research contributions. This suggests a growing interest in how digital transformation in MSMEs intersects with sustainability, particularly in relation to sustainable development, digital platforms, and the sharing economy. The evolving discourse reflects a shift

from purely technological considerations to broader economic and environmental concerns, where MSMEs leverage digital tools to enhance business resilience and promote sustainable practices. Additionally, innovation and economic growth are gaining prominence in recent studies, highlighting the role of digital entrepreneurship in driving macroeconomic advancements and shaping modern business ecosystems.

Furthermore, the rise of digitization, electronic commerce, and entrepreneurial activity in the green-to-yellow spectrum suggests that digital transformation research has gradually expanded to include practical applications in business operations. This shift indicates a transition from theoretical discussions on technology adoption to empirical studies that explore real-world entrepreneurial impacts, particularly in e-commerce and digital markets. The presence of interconnected keywords such as gig economy and digital platforms suggests that recent studies are also focusing on how digitalization is reshaping business models, promoting flexible work arrangements, and fostering innovation-driven entrepreneurial ecosystems.

4.2 Citation Analysis

Table 1. The Most Impactful Literatures

Citations	Authors and year	Title	Contributions
1847	[19]	The real-time city? Big data and smart urbanism	Explores the role of big data in shaping smart urban environments and its implications for urban governance, planning, and digital infrastructure.
1359	[20]	The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes	Examines how digital technologies are reshaping entrepreneurship and innovation, highlighting key challenges, emerging themes, and future research directions.
901	[21]	Algorithmic labor and information asymmetries: A case study of Uber's drivers	Analyzes the impact of algorithm-driven labor platforms on workers, focusing on information asymmetries and power dynamics in the gig economy.
730	[22]	China's manufacturing locus in 2025: With a comparison of "Made-in-China 2025" and "Industry 4.0"	Compares China's Made-in-China 2025 policy with the Industry 4.0 initiative, discussing their implications for digital transformation and manufacturing competitiveness.
506	[23]	Uberland: How algorithms are rewriting the rules of work	Investigates how digital platforms and algorithms are transforming labor markets, with a specific focus on ride-sharing services like Uber.
359	[24]	Humans as a service: The promise and perils of work in the gig economy	Explores the rise of gig work, analyzing its benefits and risks, including precarious employment conditions and the role of digital labor platforms.
327	[25]	Can you gig it? an empirical examination of the gig economy and entrepreneurial activity	Investigates how participation in gig work influences entrepreneurial activity, providing empirical insights into the relationship between digital labor platforms and new business formation.
248	[26]	The age of digital entrepreneurship	Examines how digital transformation is reshaping entrepreneurship, emphasizing digital business models, innovation, and emerging digital startups.

| Citations	Authors and year	Title	Contributions
248	[27]	Digital entrepreneurship: Innovative business models for the sharing economy	Explores the rise of digital entrepreneurship and its impact on business models within the sharing economy, highlighting innovation and scalability.
237	[28]	Architecting gloCal (global-local), real-virtual incubator networks (G-RVINs) as catalysts and accelerators of entrepreneurship in transitioning and developing economies: Lessons learned and best practices from current development and business incubation practices	Discusses global-local business incubation models and their role in fostering entrepreneurship in developing economies through digital and physical networks.

Source: Scopus, 2025
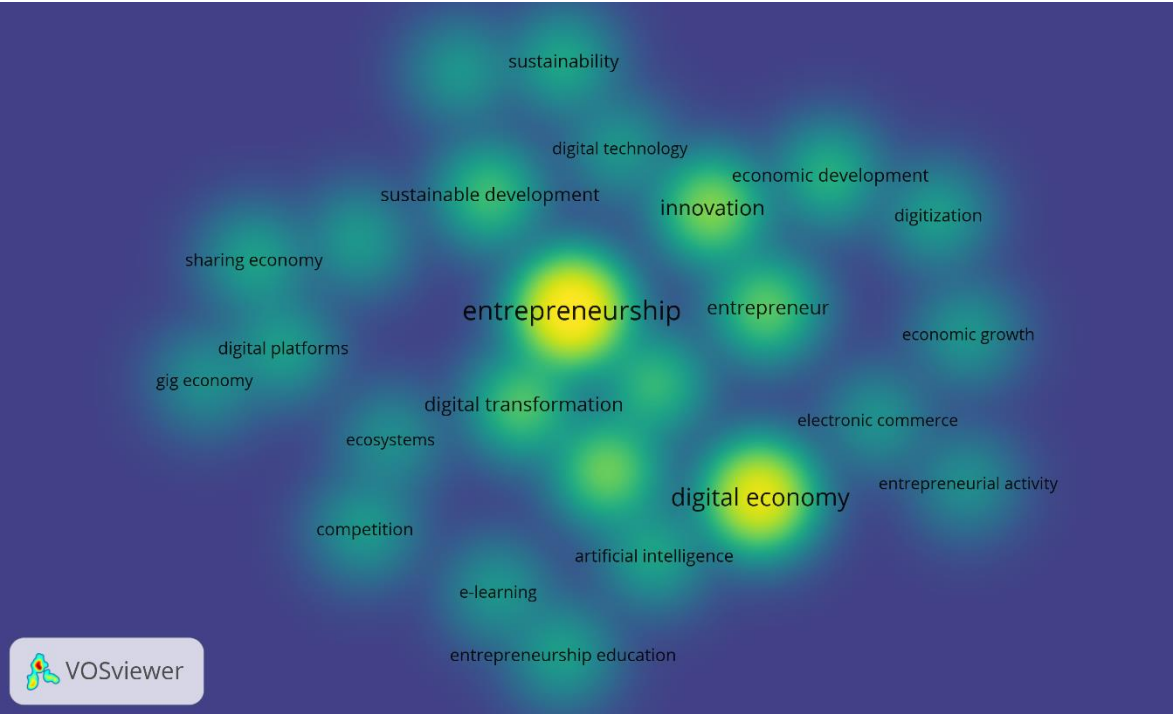
Figure 3. Density Visualization
Source: Data Analysis Result, 2025

The heatmap visualization generated using VOSviewer highlights the most frequently occurring terms in the scholarly discourse on digital transformation, MSME entrepreneurship, and the creative economy. The bright yellow areas indicate high-intensity research focus, with entrepreneurship, digital economy, and digital transformation emerging as the most dominant themes in the field. These terms serve as the conceptual core around which various related topics revolve, signifying that academic discussions predominantly center on the intersection of entrepreneurial activities and digital innovation. The clustering of related terms such as innovation, economic development, and entrepreneurial activity suggests a strong research emphasis on how digital transformation contributes to business growth and economic progress.

Beyond the core topics, the green and blue areas indicate moderately researched themes, such as sustainability, digital technology, artificial intelligence, and sharing economy. These topics,

while still significant, receive relatively less attention compared to the dominant terms, suggesting that they represent emerging areas of study. The presence of gig economy and digital platforms further underscores the evolving nature of digital entrepreneurship, particularly in relation to new business models enabled by technological advancements. This heatmap confirms that while much research has been dedicated to fundamental aspects of digital entrepreneurship, there is still room for deeper exploration of sustainability-driven digital transformation, AI-driven entrepreneurship, and the long-term impact of digital platforms on MSME competitiveness.
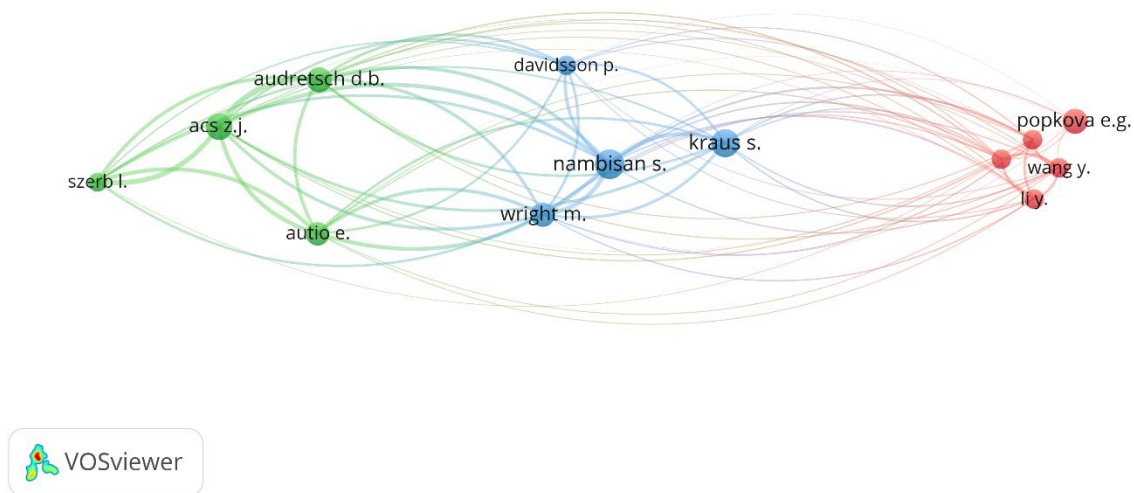
4.3 Co-Authorship Network

Figure 4. Author Visualization
Source: Data Analysis Result, 2025

The co-authorship network visualization generated by VOSviewer illustrates the collaborative structure among researchers in the field of digital transformation, MSME entrepreneurship, and the creative economy. The nodes represent individual authors, while the connecting lines indicate co-authorship relationships, with different colors signifying distinct collaborative clusters. Three primary clusters emerge: the green cluster, featuring key authors such as Szerb L., Audretsch D.B., Acs Z.J., and Autio E., likely focusing on entrepreneurial ecosystems and innovation policies; the blue cluster, with Nambisan S., Wright M., Kraus S., and Davidsson P., centered on digital entrepreneurship, innovation, and business models; and the red cluster, comprising Popkova E.G., Wang Y., and Li Y., which seems to focus on digital economy transformations, economic development, and sustainability aspects. The interconnections between clusters indicate cross-disciplinary collaboration, suggesting that while each group has its specialized research focus, there are areas of overlap where scholars exchange insights.
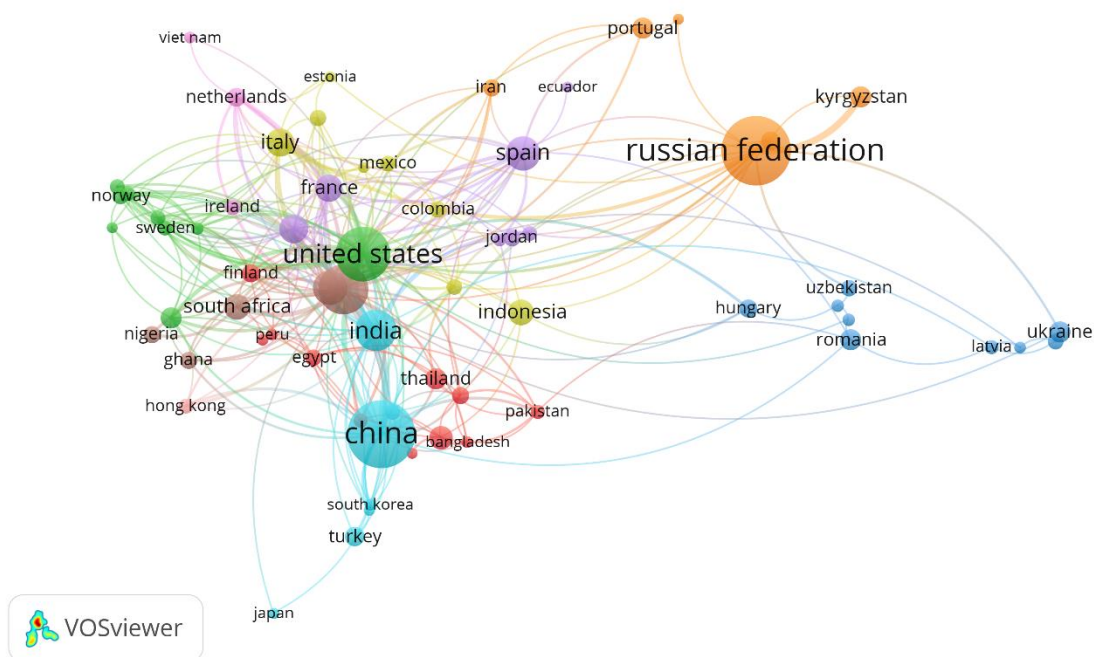
Figure 5. Country Visualization
Source: Data Analysis Result, 2025

The country collaboration network visualization generated by VOSviewer showcases international research collaborations in the field of digital transformation, MSME entrepreneurship, and the creative economy. The node sizes represent the volume of publications from each country, while the connecting lines indicate co-authorship relationships, with different colors signifying distinct clusters of collaborating nations. The United States, China, India, and Russia emerge as dominant research contributors, reflecting their significant academic and industrial interest in digital transformation. The United States has strong connections with European nations such as Italy, France, the Netherlands, and Sweden, suggesting cross-regional collaboration in digital entrepreneurship and policy research. China and India exhibit close ties, with additional linkages to South Korea, Turkey, and Japan, indicating active research partnerships in technology-driven entrepreneurship. Meanwhile, Russia has a distinct collaboration network, prominently engaging with Kyrgyzstan, Uzbekistan, Ukraine, and Romania, highlighting regional research interests in digital economies and post-Soviet economic transformation. The network also includes emerging research hubs such as Indonesia, South Africa, and Mexico, demonstrating increasing global participation in the discourse on digital transformation and MSME development.

Discussion

1. Overview of Key Research Trends in Digital Transformation and MSME Entrepreneurship

The findings from the bibliometric analysis provide significant insights into the evolving landscape of research on digital transformation in MSME entrepreneurship within the context of the creative economy. The network visualization highlights the dominance of key themes such as entrepreneurship, digital economy, and digital transformation, reflecting the growing academic interest in how digital technologies are reshaping small and medium-sized enterprises (MSMEs). The co-occurrence of terms such as innovation, economic growth, sustainability, and artificial intelligence indicates that researchers are increasingly focusing on the intersection between technology adoption, business growth, and sustainable development.

One of the notable observations from the heatmap analysis is the intensity of research around entrepreneurship and digital economy, suggesting that scholars primarily investigate how MSMEs leverage digital tools to drive economic progress. Meanwhile, emerging topics such as the gig economy, digital platforms, and artificial intelligence have gained traction in recent years, signaling a shift toward exploring platform-based business models and algorithmic decision-making in entrepreneurship. The increasing role of artificial intelligence (AI) in business processes underscores the growing relevance of automation and data-driven decision-making in MSME competitiveness. The temporal analysis also sheds light on how research themes have evolved over time. Earlier studies (2020–2021) focused on fundamental digital transformation strategies, entrepreneurship education, and ecosystems, while more recent research (2021–2022) has shifted toward sustainability, innovation, and economic development. This transition indicates that scholars are moving beyond the initial discussions of digital adoption to examine long-term impacts, scalability, and ethical considerations related to digital transformation in MSMEs.

2. The Role of Digital Transformation in MSME Growth and Sustainability

Digital transformation has been widely recognized as a key enabler of business resilience and growth, particularly in the MSME sector, which has traditionally faced constraints such as limited financial resources, inadequate technological expertise, and market entry barriers (OECD, 2018). The bibliometric analysis reinforces this notion, as digital economy and digital transformation are strongly linked to economic growth and innovation, highlighting their role in fostering business development.

One of the most important drivers of MSME success in the digital age is e-commerce and electronic platforms, which allow small businesses to expand their market reach, improve operational efficiency, and enhance customer engagement [29]. The strong research focus on digital platforms and electronic commerce reflects the increasing recognition that digital transformation is not merely about technological adoption but also about business model innovation. The rise of platform-based entrepreneurship (e.g., selling products on Amazon, engaging in freelance work via Upwork, or operating a business on Shopify) has created new opportunities for MSMEs, reducing traditional barriers to entry.

Another critical aspect of digital transformation is sustainability, which has emerged as a major research theme in recent years. The bibliometric visualization highlights the increasing connection between digital transformation and sustainable development, suggesting that MSMEs are now being examined not only for their economic contributions but also for their role in achieving environmental and social sustainability. Digital technologies such as AI-driven optimization, cloud computing, and blockchain are increasingly used to develop sustainable business models that reduce waste, optimize resource allocation, and enhance supply chain transparency.

However, while digital transformation offers substantial benefits, it also presents several challenges for MSMEs, particularly in developing economies. Many small businesses struggle with technological adoption, cybersecurity risks, and digital literacy barriers, which hinder their ability to fully leverage digital tools. Furthermore, the increasing reliance on digital platforms and gig economy structures raises concerns about job precarity, algorithmic biases, and data privacy issues. As such, future research must address how MSMEs can navigate these challenges to ensure inclusive and equitable digital transformation.

3. The Emerging Role of the Creative Economy in MSME Digital Transformation

The creative economy, characterized by industries that combine cultural, artistic, and technological elements, has gained considerable attention in digital transformation research. The bibliometric analysis highlights the intersection between digital transformation, innovation, and the creative economy, suggesting that entrepreneurship in creative sectors is increasingly driven by

digital tools. This trend aligns with the work of [30], [31], who emphasize that creativity and technology are interdependent forces shaping modern entrepreneurship.

One of the key ways in which the creative economy integrates with digital transformation is through platform-based business models and content-driven enterprises. Digital platforms such as YouTube, TikTok, and Patreon have enabled entrepreneurs to monetize creative content, while technologies like NFTs (non-fungible tokens), augmented reality (AR), and virtual reality (VR) have opened up new revenue streams in industries such as art, fashion, gaming, and music production. These developments indicate that digital transformation is not only affecting traditional business models but also creating entirely new markets in the creative economy.

However, the increasing digitization of the creative economy also raises important challenges and ethical concerns, including intellectual property rights, algorithm-driven content curation, and market monopolization by tech giants. The dominance of a few major platforms (e.g., Google, Meta, Amazon) raises concerns about creator compensation, algorithmic biases, and digital labor exploitation. As the bibliometric analysis suggests, these issues remain underexplored in digital entrepreneurship research, highlighting the need for future studies that examine regulatory frameworks and equitable platform economies.

4. Global Research Collaboration and Knowledge Gaps

The co-authorship network analysis reveals significant global collaboration patterns in digital transformation research. The United States, China, India, and Russia emerge as major contributors, reflecting their strong research output in digital entrepreneurship and innovation. The United States collaborates heavily with European nations (Italy, France, Sweden), while China has strong ties with South Korea, Japan, and India. These collaborations suggest that digital transformation research is highly interconnected across continents, with scholars working together on policy implications, technology adoption, and entrepreneurial strategies. However, the visualization also reveals underrepresented regions in digital transformation research, particularly in Africa, Latin America, and parts of Southeast Asia. Given that MSMEs in developing economies face unique digitalization challenges, there is a need for more region-specific studies that examine barriers to digital adoption, financial inclusion, and the role of digital entrepreneurship in economic development. Policymakers, researchers, and funding agencies should prioritize collaborative research initiatives that incorporate diverse perspectives from emerging economies.

Additionally, the author collaboration network analysis highlights key thought leaders in digital transformation and entrepreneurship research. Scholars such as Nambisan, Wright, and Kraus have contributed significantly to digital innovation, business model transformation, and entrepreneurial ecosystems. Meanwhile, researchers like Popkova, Wang, and Li focus on economic development and sustainability in digital economies. These clusters suggest that while research in this field is robust, there are still opportunities for interdisciplinary collaboration between technology experts, economists, and sustainability scholars.

5. Future Research Directions and Policy Implications

Based on the bibliometric findings, several future research avenues emerge:
a. Sustainability and Digital MSMEs – Future studies should examine how MSMEs can integrate sustainable practices through digital transformation while balancing profitability and social impact.
b. Regulatory and Ethical Implications – The increasing use of AI, digital platforms, and gig economy structures raises concerns about labor rights, algorithmic fairness, and data privacy.
c. Regional Case Studies – More research is needed to understand how MSMEs in developing economies navigate digital transformation, addressing barriers such as financial access, infrastructure, and policy support.

    d.   Creative Economy and Digital Entrepreneurship – Given the growing role of NFTs, digital art, and platform-based content creation, future research should explore business model innovations and monetization strategies.

CONCLUSION

This study provides a comprehensive bibliometric analysis of digital transformation in MSME entrepreneurship within the creative economy, highlighting key research trends, thematic evolutions, and global collaborations. The findings reveal that entrepreneurship, digital economy, and digital transformation are the dominant themes in scholarly discourse, with growing interest in innovation, sustainability, and platform-based business models. The increasing role of AI, e-commerce, and the gig economy suggests that digital transformation is reshaping MSMEs by expanding market opportunities, enhancing efficiency, and enabling new business models. However, challenges such as technological barriers, cybersecurity risks, and ethical concerns in digital labor remain prevalent. The co-authorship and country collaboration analyses indicate that research is highly interconnected among major economies, yet there is a need for more studies in underrepresented regions, particularly in Africa and Latin America. Future research should focus on sustainability-driven digital entrepreneurship, ethical platform governance, and policy frameworks for inclusive digital transformation. Overall, this study underscores the transformative potential of digital technologies in MSME entrepreneurship while advocating for equitable and sustainable strategies to maximize their impact in the creative economy era.

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