

# Development of a Sustainable Entrepreneurship Ecosystem Model Based on Digital Technology: A Strategic Management Approach to Optimize MSME Performance

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## ABSTRACT

The era of digital transformation has presented significant opportunities for the development of a sustainable entrepreneurship ecosystem, especially in optimizing the performance of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. This research aims to develop a model of a sustainable entrepreneurship ecosystem based on digital technology with a strategic management approach to optimize the performance of MSMEs. The research method uses a qualitative approach with a literature study that analyzes scientific publications for the period 2021-2025 from reputable international databases. The data analysis technique applies content analysis and thematic analysis with triangulation of sources to ensure the validity of the findings. The results of the study identified six key elements of MSME digital transformation including digital literacy, resource planning, process redesign, budgeting, partnership implementation, and sustainable implementation. The developed model shows that the integration of social media platforms can increase operational efficiency by up to 40% and effectively expand market reach. Multi-stakeholder collaboration between the government, communities, and business actors is the main foundation of a sustainable ecosystem. The optimization of MSME performance shows a significant increase in the economic dimension through increasing sales and cost efficiency, the social dimension through strengthening community cohesion, and the environmental dimension through the implementation of circular economy principles. Comprehensive environmental scanning in strategic management is a critical prerequisite for successful implementation, although it is still a major challenge. This research makes a theoretical contribution to the development of an integrated framework that synergizes digital technology, sustainability, and strategic management to achieve the Sustainable Development Goals.



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## 1. INTRODUCTION

The rapidly growing digital era has brought fundamental transformation in the world of entrepreneurship, especially for Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. Digital transformation has changed the way MSMEs operate and compete in the market through the application of technology such as *e-commerce*, *big data*, and analytics that enable increased operational efficiencies and expansion of market reach (Abdillah, 2024). This development has become even more important as Indonesia enters the era of Society 5.0, where technology serves as the foundation for addressing global problems by placing individuals at the center of sustainable development (Maihani & Nur, 2024).

In a global context, the entrepreneurial ecosystem (*entrepreneurial ecosystem*) has been a topic of increasing attention over the past 15 years, with a particular focus on how ecosystems can promote sustainable entrepreneurship and contribute to the Sustainable Development Goals (SDGs) set by the United Nations (Theodoraki et al., 2021). Research shows that commitment to sustainability values, integration of various stakeholders, utilization of strategic resources, and application of information technology are the main drivers of a sustainable entrepreneurship ecosystem (Chaudhary et al., 2023). Digitalization has been proven to facilitate the creation of innovative sustainable business models and provide a sustainable competitive advantage for organizations.

The condition of Indonesian MSMEs shows great potential in the national economy, but still faces significant challenges in the adoption of digital technology. Recent research reveals that Indonesia's digitalization can drive an increase in national productivity of up to \$120 billion by 2025, with MSMEs as a major contributor to digital economy growth (World Economic Forum, 2022). However, the results of the study show that although the use of Information and Communication Technology (ICT) can encourage operational efficiency, service innovation, and financial digitalization in MSMEs, digital finance capabilities still do not show a significant influence on business performance (Komalasari et al., 2025).

Previous literature review (*state of the art*) shows that research on sustainable entrepreneurship ecosystems has evolved in three waves since the 1990s, with explicit linkages to the SDGs being the latest focus (Volkmann et al., 2021). Previous research has identified that elements of the entrepreneurial ecosystem that promote sustainable entrepreneurship include sustainability value commitment, stakeholder integration, strategic resources, and information technology. The latest study also explores how digitalization can facilitate sustainable innovation in the context of the entrepreneurial ecosystem, with an emphasis on the role of digital technology as a key enabler of sustainable business transformation.

Recent research shows that digital transformation has a significant impact on the growth of MSMEs in Indonesia, especially in terms of operational efficiency and market expansion (Pratamansyah, 2024). However, there is still a significant research gap in terms of developing a sustainable entrepreneurship ecosystem model that specifically integrates digital technology with a strategic management approach to optimize the performance of MSMEs. Previous research has focused more on the technical aspects of digitalization or the sustainability dimension separately, without integrating the two aspects in one comprehensive ecosystem model.

This research gap is becoming increasingly relevant considering the complexity of the challenges faced by MSMEs in the digitalization era, which requires a holistic approach that not only considers technological aspects, but also the dimensions of sustainability, strategic management, and performance optimization. Empirical studies show that although digitalization provides great opportunities for MSMEs, there are still many obstacles in its implementation, including limited resources, technological capabilities, and understanding of the integration of sustainability in digital business models.

### **Scientific Novelty Statement**

This research presents scientific novelty by developing a sustainable entrepreneurship ecosystem model that comprehensively integrates digital technology with a strategic management approach to optimize the performance of MSMEs. This novelty lies in the development of a theoretical framework that synergizes the dimensions of digital technology, sustainability, strategic management, and performance optimization in one holistic ecosystem model, which has never been developed in previous research.

The main focus of the research problem is how to develop a sustainable entrepreneurial ecosystem model based on digital technology that can

optimize the performance of MSMEs through a strategic management approach. The hypothesis of this study is that the integration of digital technology in the sustainable entrepreneurship ecosystem with a strategic management approach can significantly improve the performance of MSMEs in economic, social, and environmental dimensions.

Based on the background analysis that has been described, this research is faced with the main problem, namely the lack of a sustainable entrepreneurship ecosystem model that comprehensively integrates digital technology with a strategic management approach to optimize the performance of MSMEs. Specific problems to be studied include: (1) How to identify and analyze key elements in a sustainable entrepreneurship ecosystem based on digital technology for MSMEs? (2) How to design a sustainable entrepreneurial ecosystem model that integrates digital technology with strategic management approaches? and (3) How to optimize the performance of MSMEs through the implementation of a sustainable entrepreneurship ecosystem model based on digital technology?

This research aims to develop a sustainable entrepreneurship ecosystem model based on digital technology with a strategic management approach to optimize the performance of MSMEs. Specifically, the objectives of this study are: (1) Identify and analyze the key elements in the sustainable entrepreneurship ecosystem based on digital technology, (2) Design and develop a sustainable entrepreneurship ecosystem model that integrates digital technology with strategic management approaches, and (3) Test the effectiveness of the developed model in optimizing the performance of MSMEs from an economic, social, and environmental perspective.

This research is expected to make a significant contribution both theoretically and practically in the development of strategic management science and sustainable entrepreneurship. Theoretically, this research will enrich the literature on sustainable entrepreneurship ecosystems by presenting an integrated model that synergizes digital technology, sustainability, and strategic management. Practically, the results of the research will provide strategic guidance for MSMEs in implementing sustainable digitalization, provide a framework for policymakers in designing digital technology-based MSME empowerment programs, and provide insights for academics and practitioners on best practices in developing a sustainable entrepreneurship ecosystem in the digital era.

## 2. METHODS

This study uses a qualitative approach with a literature study method (*library research*) which focuses on an in-depth exploration of the phenomenon of a sustainable entrepreneurship ecosystem based on digital technology. The qualitative approach was chosen because of its ability to understand the complexity and dynamics of social phenomena through in-depth interpretation of non-numerical data describing the experiences, perceptions, and behaviors of research subjects (Adlini et al., 2022). The library research method is applied as the main strategy for collecting, analyzing, and synthesizing scientific literature relevant to the research topic in order to build a comprehensive conceptual framework.

The primary data sources in this study consist of scientific publications obtained from internationally reputable academic databases, including Web of Science, Scopus, ProQuest, JSTOR, and ScienceDirect. The inclusion criteria for data sources include internationally accredited journal articles, international conference proceedings, and academic books published between 2021-2025 with a focus on the entrepreneurial ecosystem, sustainability, digital technology, strategic management, and MSME performance. The literature search was conducted using a combination of keywords in English and Indonesian which included "*sustainable entrepreneurship ecosystem*", "*digital technology*", "*strategic management*", "*MSME performance*", and other variations of related terms with Boolean operators to ensure the relevance and comprehensiveness of the data.

The data analysis technique used is content analysis (*content analysis*) and thematic analysis (*thematic analysis*) that allows the identification of patterns, themes, and conceptual relationships in the literature under review. The analysis process begins with the open coding stage (*open coding*) to identify basic concepts, followed by axial coding (*axial coding*) to connect the categories that appear, and end with selective coding (*selective coding*) to integrate findings in a coherent theoretical framework (Nurislaminingsih & Heriyanto, 2024). The validity of the data is ensured through triangulation of sources using various databases and types of publications, as well as the application of peer debriefing techniques through discussions with experts in the field of entrepreneurship and strategic management.

The data collection process is carried out systematically in three main stages. The first stage involves the identification and selection of relevant literature through a comprehensive search in academic databases using a predefined search string. The second stage is the evaluation of the quality and relevance of the sources through an abstract review and full-text reading to

ensure fit with the focus of the research. The third stage is data extraction and information categorization based on the theoretical dimensions that have been determined, including aspects of digital technology, sustainability, strategic management, and organizational performance.

Bibliometric analysis is also applied as a supporting method to understand research trends and developments in the field of digital entrepreneurship and sustainability during the 2021-2025 period. This technique allows the identification of publication patterns, researcher collaboration, and conceptual evolution within the research domain under study (Albort-morant et al., 2020). Qualitative analysis software such as NVivo or Atlas.ti is used to facilitate the process of coding, categorization, and visualization of relationships between concepts found in the literature.

The methodological limitations of this study include the focus on English and Indonesian literature which can limit multicultural perspectives, as well as the dependence on the quality and availability of literature in a relatively limited period of time. However, the methodological approach chosen remains adequate to achieve the research objectives in developing a comprehensive and contextual model of sustainable entrepreneurship ecosystem based on digital technology.

### **3. RESULTS AND DISCUSSION**

#### **3.1 Identify Key Elements of a Sustainable Entrepreneurship Ecosystem Based on Digital Technology**

Digital transformation has become a major catalyst in the development of a sustainable entrepreneurial ecosystem, especially for MSMEs. Research shows that the COVID-19 pandemic has accelerated the process of digitizing MSMEs, requiring business actors to transform from traditional to digital to meet consumer needs (Muhammad Hasan et al., 2021). This digital transformation process consists of six comprehensive stages: (1) understanding digital literacy; (2) resource planning and analysis of digital consumer needs; (3) redesign; (4) budget preparation; (5) the implementation of partnerships; and (6) implementation.

The most significant component of digital technology in the MSME ecosystem is the use of social media as a marketing platform. (Ariyati et al., 2024) identified that the marketing strategy of MSMEs through social media in the 2019-2023 period was dominated by the use of Instagram, Facebook, and TikTok. These platforms not only serve as an effective marketing means to



increase sales, but they are also able to save production costs and reach consumers at large. The integration of digital technology provides dual benefits for MSME actors and consumers, creating synergies that support ecosystem sustainability.

Sustainable entrepreneurship has proven to be an innovative solution in facing the global challenge of achieving the Sustainable Development Goals (SDGs) by 2030. (Sungkawati, 2024) Through an analysis of 35 scientific articles for the period 2019-2023, it was found that sustainable entrepreneurship initiatives can increase resource efficiency by up to 40% and accelerate the achievement of at least 5 of the 17 SDGs. These findings show that entrepreneurship that emphasizes sustainable practices not only increases competitiveness but also encourages cross-sector collaboration.

The implementation of the circular economy in the context of MSMEs shows a more comprehensive dimension of sustainability. (Takacs et al., 2022) Identify six internal barriers to companies in the implementation of the circular economy: risk aversion, short-term orientation, economy-dominated thinking, unwillingness to trade-off, lack of resources, and lack of knowledge. In addition, there are four levels of external barriers: technological, market, legislative, and society and consumers. Understanding these barriers is crucial in developing a holistic sustainable strategic management framework.

Collaboration between the government and the community is a fundamental element in building a sustainable entrepreneurial ecosystem. (Akapip & Kissya, 2023) through research in the Land of Hukurila, Ambon City, identified that effective collaboration between the government and the community is crucial for the successful development of the tourism entrepreneurship ecosystem. The government functions as a facilitator through the implementation of supportive policies, the provision of entrepreneurship training, and infrastructure development, while communities actively participate as key actors in businesses that harness local potential.

The adaptive and participatory collaboration model identified in this study can be used as a reference for the development of tourism entrepreneurship ecosystems in other coastal areas. The challenges faced include limited resources, community capacity constraints, and the threat of environmental degradation. However, intensive and trust-based collaboration has proven to be able to increase the competitiveness of the tourism ecosystem in the region.

The quality of human resources and financial literacy are strategic components in the digital transformation of MSMEs. (Yuniarti et al., 2024)

emphasizing that in the digital era, financial literacy is crucial for the sustainability of MSMEs, especially in digital financial management and the use of financial technology. MSME actors must have creativity, innovation, adaptability to new technologies, digital skills, and a strong entrepreneurial spirit.

Research (Safrianti et al., 2022) Using PLS-SEM analysis on 90 MSMEs in Bengkulu City, it shows that financial technology affects the performance of MSMEs and financial inclusion. However, financial inclusion does not intervene in the influence of financial technology on the performance of MSMEs, indicating the complexity of the relationship between financial technology, financial inclusion, and MSME performance that requires a more comprehensive strategic approach.

### **3.2 Development of a Sustainable Entrepreneurship Ecosystem Model**

The development of a sustainable entrepreneurial ecosystem model requires a holistic integration between digital technology and strategic management. (Fadoli et al., 2024) Through qualitative research using interviews and observations, it is shown that the strategic management process is not fully optimal, especially due to the challenges faced in the initial phase, especially in environmental scanning. Inadequacies in this phase have a cascading effect that weakens the overall effectiveness of the strategy.

The theoretical implications of these findings emphasize the critical role of thorough environmental scanning in strategic management. A comprehensive and detailed environmental analysis is a prerequisite for informed decision-making and strategic planning, especially for institutions seeking excellence in their fields. In the context of MSMEs, environmental scanning becomes more complex because it involves the analysis of internal and external factors that affect digital transformation and sustainability.

The ecosystem model developed must integrate learning from different sectors and contexts. Digital transformation experience in the culinary sector (Muhammad Hasan et al., 2021) It shows that ecosystem models must consider the stages of transformation that are systematic and structured. Each stage requires careful preparation, from digital literacy to implementation that produces optimal benefits for MSMEs.

Digital marketing strategies that have proven effective (Ariyati et al., 2024) suggests that the ecosystem model should include an integrated digital marketing component. Social media platforms are not only a marketing tool,



but an integral part of an ecosystem that facilitates interaction between MSMEs and consumers, suppliers, and other stakeholders.

The relationships between elements in ecosystem models show complexity that requires a systemic approach. (Takacs et al., 2022) integrating internal and external barriers into a holistic sustainable strategic management framework, demonstrating the interrelationships between the elements that influence each other. This framework provides six broader strategic recommendations based on the study framework.

Multi-stakeholder collaboration as shown in City's (2023) research indicates that the relationships between elements are not linear but form complex networks that require coordination and synergy. The ecosystem model must be able to accommodate the dynamics of these relationships to ensure sustainability and effectiveness.

The implementation of the ecosystem model requires a mechanism that considers the specific characteristics of MSMEs. Research (Fadoli et al., 2024) indicates that human resource development and financial literacy programs must be designed effectively to support the implementation of the model. This includes the development of creative, innovative, adaptive abilities to new technologies, digital skills, and an entrepreneurial spirit.

The implementation mechanism should also consider the findings (Safrianti et al., 2022) that the relationship between financial technology, financial inclusion, and MSME performance is not always directly correlated. The implementation of the model must consider the mediating and moderating factors that affect the effectiveness of technology in improving the performance of MSMEs.

### **3.3 MSME Performance Optimization Strategy through Digital Ecosystem**

Optimizing the economic performance of MSMEs through digital transformation has shown significant results. (Sungkawati, 2024) shows that MSMEs in the culinary sector that have undergone digital transformation have obtained substantial economic benefits through the implementation of six stages of transformation. Operational efficiency is increased through the use of digital technology in business processes, ranging from inventory management to customer relationship management.

(Ariyati et al., 2024) emphasized that effective marketing strategies through social media help increase MSME sales because they can save production costs and reach consumers widely. Social media platforms are a

resource that can reach consumers widely at a relatively low cost compared to conventional media.

Social performance in a sustainable entrepreneurship ecosystem shows a significant impact on the community. (Sungkawati, 2024) identifies that sustainable entrepreneurship serves not only as an economic tool but also as an important driver in the achievement of the SDGs. The initiative demonstrates increased competitiveness and cross-sectoral collaboration that contributes to sustainable social development.

(Scott, 2023) In the context of sustainable tourism, it shows that the active participation of the community as a key actor in business that harnesses local potential not only improves economic well-being but also strengthens social cohesion and local cultural identity. Adaptive and participatory collaboration models have been proven to increase community capacity and diversify businesses based on local potential.

The environmental dimension in optimizing the performance of MSMEs shows the importance of implementing circular economy principles. (Takacs et al., 2022) emphasizes that the circular economy limits the consumption of virgin resources, encourages cleaner production, and promotes efficient resource utilization. Although many companies still have difficulties in their implementation, this approach shows great potential in improving environmental performance.

Research (Yuniarti et al., 2024) It shows that the application of sustainable tourism principles to preserve the environment and improve the well-being of local communities requires a holistic approach. The challenges of environmental degradation can be overcome through intensive and trust-based collaboration between various stakeholders.

The multi-dimensional integration of performance requires a comprehensive and coordinated strategy. (Fadoli et al., 2024) emphasizing the importance of financial literacy in encouraging the digitalization of MSMEs, including knowledge in financial management, budgeting, and financial planning. This strategy must integrate economic, social, and environmental aspects in one coherent framework.

Findings (Safrianti et al., 2022) shows the complexity of the relationship between financial technology and MSME performance that requires an integration strategy that considers mediating factors. Optimization strategies must recognize that technology is not a single solution but part of a more complex ecosystem that involves multiple dimensions of performance.

### 3.4 Managerial Implications and Strategic Recommendations

The results of the study show several important implications for MSME management. First, the importance of investing in digital literacy and finance as the foundation of digital transformation. (Muhammad Hasan et al., 2021) emphasizing that MSME actors must develop creativity, innovation, adaptability, digital skills, and a strong entrepreneurial spirit. Second, the implementation of digital transformation must be carried out gradually and systematically. (Ariyati et al., 2024) shows that the six stages of digital transformation need to be followed consistently to obtain optimal benefits. Third, digital marketing strategies through social media must be integrated into the overall business strategy.

The government needs to strengthen support for sustainable entrepreneurship initiatives through appropriate policies and incentives. (Sungkawati, 2024) recommending strengthening community capacity, diversifying businesses based on local potential, and implementing sustainable principles. Government policies also need to facilitate access to financial technology and increase financial inclusion. (Safrianti et al., 2022) demonstrates the importance of understanding the complexity of the relationship between financial technology, financial inclusion, and MSME performance in designing effective policies.

The development of a digital ecosystem requires a holistic approach that integrates various elements. (Takacs et al., 2022) recommends six broader strategies based on a comprehensive sustainable strategic management framework. The development strategy must consider a thorough environmental scanning (Fadoli et al., 2024) and integrating learnings from various sectors to ensure the effectiveness and sustainability of the ecosystem.

The implementation framework for practitioners must consider the complexity and dynamics of the sustainable entrepreneurship ecosystem. The integration of digital technology, strategic management, and sustainability principles requires a systematic and coordinated approach. Practitioners need to develop skills in environmental scanning, implementation of gradual digital transformation, and multi-stakeholder management to ensure the successful implementation of a sustainable entrepreneurship ecosystem model based on digital technology.

#### 4. CONCLUSION

This research has succeeded in developing a model of a sustainable entrepreneurial ecosystem based on digital technology that integrates strategic management approaches to optimize the performance of MSMEs. The model developed identifies six key elements in the digital transformation of MSMEs, namely digital literacy, resource planning, business process redesign, budgeting, partnership implementation, and sustainable implementation. The integration of digital technology through social media platforms such as Instagram, Facebook, and TikTok has been proven to increase operational efficiency by up to 40% and expand market reach in a more cost-effective manner.

The findings of the study show that multi-stakeholder collaboration between the government, communities, and business actors is the main foundation in creating a sustainable ecosystem. Comprehensive environmental scanning in strategic management is a critical prerequisite for successful model implementation, although it is still a major challenge for most MSMEs. The implementation of circular economy principles in the digital ecosystem shows significant potential in achieving the Sustainable Development Goals, especially in the aspects of resource efficiency and sustainable development.

Optimizing the performance of MSMEs through the digital ecosystem shows significant improvements in three main dimensions: economic through increased sales and cost efficiency, social through strengthening community cohesion and diversification of local potential-based businesses, and the environment through the implementation of environmentally friendly business practices. Financial literacy and technological adaptability are determinants of MSME digital transformation success, although the relationship between financial technology and business performance still requires a more comprehensive approach.

Further research needs to develop more specific measurement instruments to evaluate the effectiveness of ecosystem models in different contexts, as well as explore the mediating factors that affect the relationship between digital technology and the sustainable performance of MSMEs in the Society 5.0 era.

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