



Building Circular Economy Capabilities: A Systematic Review of Drivers, Practices, Digital Enablers, and Sustainable Outcomes

Titis Tilam Sari^{1*}, Lies Hendrawan Krisnawati², Desika Andriani³

¹⁻³ Program Studi Akuntansi, STIE Bhakti Pembangunan, Indonesia

*Penulis Korespondensi: titistilamsari@gmail.com

Abstract. This study aims to analyze the development of circular economy capabilities and explain the driving factors, organizational capabilities, circular practices, and sustainability outcomes that are relevant to Micro, Small, and Medium Enterprises (MSMEs). The research uses a Systematic Literature Review (SLR) combined with bibliometric analysis of Scopus-indexed publications for the 2010-2026 period. The initial search yielded 402,309 documents. After the process of checking and eliminating duplication in the selected dataset, 35 unique articles were obtained, with 20 articles explicitly discussing the circular economy, circularity, circular supply chain, or circular business model. The results show that circular economy capabilities are not formed as a single ability, but develop through the interaction between innovation capabilities, collaboration, digitalization, knowledge management, governance, and organizational capabilities. Digitalization plays an enabling role that strengthens the implementation of circular practices when supported by organizational readiness and strategic capabilities. Practices identified include resource use reduction, reuse, material recovery, recycling, circular design, backflow management, and circular business model development. The research synthesis resulted in an integrative framework driving $\rightarrow$ circular economy capabilities $\rightarrow$ circular practices $\rightarrow$ sustainable outcomes. Sustainable outcomes include improved resource efficiency, waste and emissions reduction, supply chain resilience, economic performance, and business resilience. This study expands the understanding of the circular economy from a practice-based approach to an organizational capability perspective and shows that empirical evidence specifically addressing MSMEs is still limited, opening up space for further research.

Keywords: Circular Economy Capabilities; Circular Economy; Digital Transformation; Innovation; MSMEs.

1. BACKGROUND

Changing the orientation of development towards sustainability requires organizations to manage resources efficiently, adaptively, and responsibly. For Micro, Small, and Medium Enterprises (MSMEs), business sustainability increasingly depends on the ability to acquire knowledge, develop innovations, utilize technology, and respond to changes in the business environment. Operational readiness, infrastructure, data management, and investment feasibility are important prerequisites for responsible technological transformation for MSMEs (Naranjo et al., 2026). On the other hand, the digital-circular path shows that digitalization needs to be integrated with circular strategies and changes in business processes in order to support sustainable value creation (Menegoli et al., 2026).

In textile MSMEs, operational readiness, infrastructure, data management, and investment feasibility are important prerequisites for responsible technological transformation (Naranjo et al., 2026). In the framework of the circular economy, these capabilities are becoming increasingly important because organizations need to integrate circular principles into value creation, knowledge management, innovation, technology, and decision-making. The integration of digitalization and circular practices also needs to be supported by supply

chain orchestration and business model innovation to generate performance benefits (Panda et al., 2026).

The literature shows that the circular economy is increasingly related to innovation, digitalization, knowledge, and strategic decision-making. The Scopus search for the period 2010-2026 yielded 402,309 documents spread across various fields, especially Business, Management and Accounting, Social Sciences, Engineering, Computer Science, and Economics, Econometrics and Finance. The dominance of keywords such as sustainable development, innovation, sustainability, decision-making, SMEs, artificial intelligence, and digital transformation confirms that the circular economy has developed as a multidisciplinary field. Recent studies show that green knowledge sharing and sustainability-oriented resources support organizational innovation and competitiveness (Makumbe & Lisita, 2026; Romano et al., 2026). At the same time, Digital Product Passports and artificial intelligence-based platforms are expanding the role of digitalization in transparency, knowledge exchange, and the development of circular business models (Becchi et al., 2026; Sharma et al., 2026).

Although studies on sustainability, innovation, digitalization, and the circular economy are growing rapidly, the literature still places the driving factors, capabilities, practices, and outcomes of sustainability in relatively separate streams of studies. The latest study emphasizes different aspects, ranging from the technological readiness of MSMEs (Naranjo et al., 2026), circular dynamic capabilities (Ayati et al., 2026), logistics and supply chain capabilities (Wangwacharakul & Sandberg, 2026), to the adoption factors of circular supply chain practices in MSMEs (Nguyen et al., 2026). Another study highlights the barriers to the adoption of circular economy designs (Abad et al., 2026) as well as the importance of the supplier-buyer relationship in extending the life of products and overcoming the limited resources of MSMEs (Vellesalu et al., 2026). Thus, the main gap lies in the absence of an analytical framework that integrates drivers, capabilities, circular practices, and sustainability outcomes. Based on these gaps, this study aims to synthesize the literature on circular economy capabilities and their relevance to MSMEs through four research questions:

RQ1. What factors encourage the formation of relevant circular economy capabilities for MSMEs?

RQ2. What organizational capabilities support the transformation towards a circular economy?

RQ3. How do circular economy capabilities translate into circular practices through innovation, digitalization, and collaboration?

RQ4. What sustainability outcomes are produced from circular economy capabilities and practices, and what are the implications for MSMEs?

2. THEORETICAL STUDIES

Circular economy capabilities in MSMEs can be understood as the ability of organizations to integrate knowledge, innovation, technology, and sustainability-orientation into business processes. These capabilities are not only determined by resource ownership, but especially by the organization's ability to combine, develop, and convert resources into business practices that generate sustainable value. Ayati et al. (2026) identified three complementary capability groups, namely Foundational Innovation Capabilities, Transitional Collaboration Capabilities, and Scaling Enablement Capabilities.

Knowledge has strategic value when it can be translated into organizational actions. Makumbe and Lisita (2026) show that green knowledge sharing plays a role in the relationship between green transformational leadership and green innovation, while Romano et al. (2026) emphasize the role of knowledge management and sustainability-oriented resources in supporting the competitiveness of the manufacturing industry. The findings show that sustainability-oriented knowledge and resource management are an important part of the formation of circular economy capabilities. Circular economy capabilities can be positioned as an organization's ability to transform knowledge, technology, and innovation into practices that support economic, environmental, and business sustainability.

Digitalization and innovation are two important mechanisms in the development of circular economy capabilities. Digitalization provides access to information, accelerates decision-making, supports efficiency, and opens up opportunities for the formation of new business models. However, the benefits of digitalization do not arise automatically because its effectiveness depends on the readiness of human resources, organizational capabilities, and managerial ability to utilize technology strategically. Digital technologies also support transparency, knowledge exchange, and circularity through Digital Product Passports (Becchi et al., 2026), while artificial intelligence-based platforms can facilitate the matching of resources in circular business models (Sharma et al., 2026).

Evidence in the wine industry suggests the existence of digital-circular pathways that connect technology with circular practices and organizational change (Menegoli et al., 2026). In the context of textile MSMEs, the benefits of technological transformation also depend on operational and organizational readiness (Naranjo et al., 2026), while in manufacturing companies, twin transitions are strengthened through supply chain orchestration and business model innovation (Panda et al., 2026).

The formation of circular economy capabilities is also influenced by decision-making capabilities and ecosystem support. In agricultural processing MSMEs, organizational and

interorganizational factors mediate the influence of technology and environment on the decision to adopt circular supply chain practices (Nguyen et al., 2026). The supplier-buyer relationship can also help MSMEs overcome internal resource limitations while extending the life of products (Vellesalu et al., 2026).

Decision-making determines how the organization allocates resources, utilizes knowledge, adopts technology, and chooses the form of innovation that is in line with sustainability goals. In agricultural processing MSMEs, the decision to adopt circular supply chain practices is influenced by organizational and interorganizational factors (Nguyen et al., 2026). The supplier-buyer relationship expands access to external resources and supports the extension of product life (Vellesalu et al., 2026). In addition, circular practices and policies in packaging companies are related to the environmental performance of packaging, which confirms the importance of internal policy support in the implementation of circularity (Danvers et al., 2026).

Based on the synthesis of the literature, the results of the development of circular economy capabilities are multidimensional and include environmental performance, financial performance, organizational performance, competitive advantage, adaptability, and business sustainability. Circular economy practices are related to corporate performance in various corporate contexts (Conca et al., 2026), while circular strategies in agri-food supply chains can support business resilience (Spada et al., 2025). In the textile and fashion sectors, logistics and supply chain capabilities play a role in the creation of economic, environmental, and social value (Wangwacharakul & Sandberg, 2026).

The relationship shows that the circular economy is not sufficiently understood as a set of stand-alone environmental practices, but as an organizational transformation process that connects the driving factors, capability development, implementation of circular practices, and the creation of sustainable outcomes. Based on these relationships, the theoretical framework of this research is formulated as a driver of circular economy capabilities → capabilities → circular practices → sustainable outcomes. Capability drivers include green knowledge, digitalization, innovation, human competence, decision-making, and collaboration, while the results include environmental, economic, organizational, and business sustainability values. This framework places organizational capabilities as the main mechanism that explains how external resources and support are converted into circular economy practices and *sustainable outcomes*.

3. METHOD

This study uses a *Systematic Literature Review* (SLR) combined with descriptive bibliometric analysis to map the development of *circular economy capabilities* and their relevance for Micro, Small, and Medium Enterprises (MSMEs). Data were obtained from the Scopus database, with the scope of publications for the period 2010-2026. The initial search resulted in 402,309 documents that were used as the basis for mapping the general structure of the literature. Bibliometric analysis includes the field of science, type of document, publication language, keywords, country of origin of publication, type of source, and author productivity. This approach is used to identify the development, distribution, and intellectual structure of research related to the circular economy, sustainability, innovation, digitalization, and MSMEs.

The analysis is carried out through three main stages. The first stage includes the identification and mapping of publication characteristics to describe the development of the literature in a descriptive manner. The second stage analyzes bibliometric patterns based on the distribution of fields of knowledge, types of documents, languages, keywords, countries, publication sources, and authors. The third stage conducts thematic synthesis of relevant literature by focusing on the relationship between *drivers*, circular economy capabilities, *circular practices*, and *sustainable outcomes*. To ensure consistency and transparency in the literature selection process, the thematic synthesis is based on inclusion and exclusion criteria that have been systematically determined. These criteria are used to ensure that each article analyzed has direct relevance to the focus of the research. Details of inclusion and exclusion criteria are presented in Table 1.

Table 1. Inclusion and Exclusion Criteria

Aspec	Criteria Inclusion	Exclusion Criteria
Basis data	Scopus Indexed	Not from Scopus
Period of project	2010–2026	Beyond 2010–2026
Focus of the study	<i>Circular economy, circularity, circular supply chain, circular business model, atau circular practices</i>	Not discussing the circular economy substantively.
Fokus kapabilitas	Discuss relevant capabilities, innovations, digitalization, knowledge, collaboration, or practices.	Discussing the concept without any connection to the circular economy
Context	Relevant to companies and/or MSMEs	Irrelevant to the context of the organization or business
Availability information	of Titles, abstracts, metadata, and adequate analytical information	Inadequate information for the selection and synthesis process
Duplication	Unique articles	Duplicates by title and/or DOI
Relevance synthesis	of Contains information about <i>drivers</i> , capabilities, practices, or <i>sustainable outcomes</i>	Doesn't provide information relevant to the synthesis framework

Source: data processed (2026)

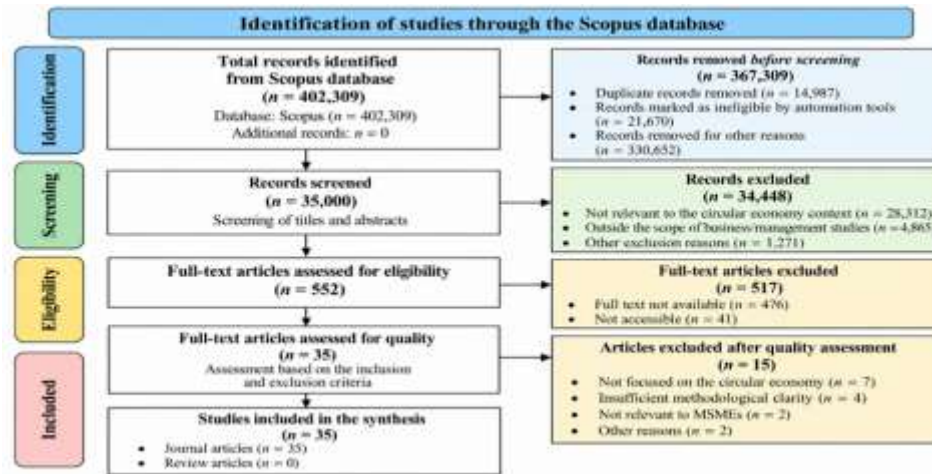


Figure 1. Prism Diagram

Figure 1. The PRISMA diagram shows that an initial search of the Scopus database yielded 402,309 documents. From the selected dataset of 49 records, the title and DOI check process identified 14 duplicates, resulting in 35 unique articles.

4. RESULTS AND DISCUSSION

Examination of 49 records resulted in 35 unique articles after duplicates based on titles and DOIs were removed. Of these, 20 articles explicitly discussed *circular economy*, *circularity*, *circular supply chain*, or *circular business models*. The thematic synthesis produced four main themes, namely driving factors, circular economy capabilities, circular practices, and sustainability outcomes. These patterns form a framework of drivers → circular economy capabilities → circular practices → sustainable outcomes. Here are the characteristics of the data and structure of the literature:

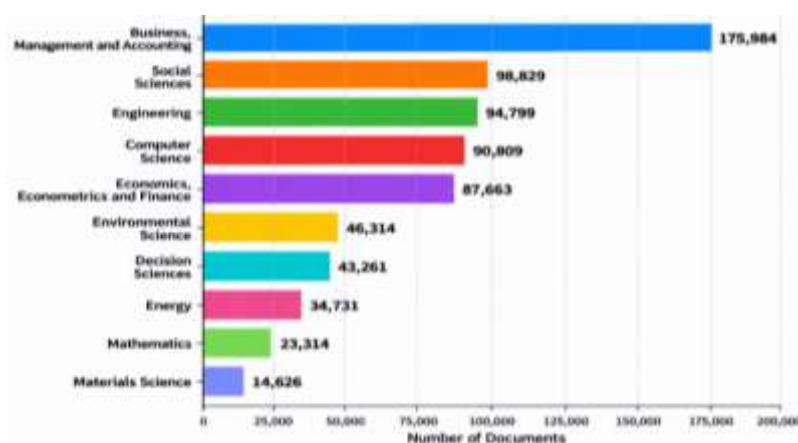


Figure 2. Subject Area Distribution

Figure 2. It shows the distribution of the field of study: the most publications came from Business, Management and Accounting with 175,984 documents, thus showing the dominance of studies in the field of business and management. Furthermore, publications were

found in Social Sciences as many as 98,829 documents, Engineering as many as 94,799 documents, Computer Science as many as 90,809 documents, and Economics, Econometrics and Finance as many as 87,663 documents. Meanwhile, the fields of Environmental Science, Decision Sciences, Energy, Mathematics, and Materials Science have a lower number of publications. These findings show that the topics analyzed are multidisciplinary, but have the strongest linkages to the fields of management, business, and social sciences.

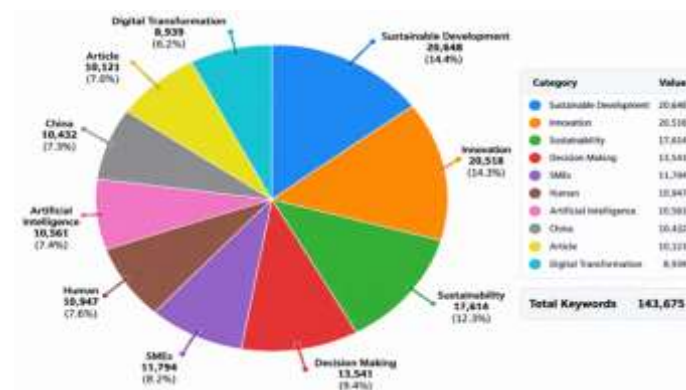


Figure 3. Keyword Distribution

Figure 3 shows that *Sustainable Development* is the most dominant keyword with 20,648 appearances, followed by *Innovation* with 20,518 and *Sustainability* with as many as 17,614. Furthermore, *Decision Making* appears 13,541 times, *SMEs* 11,794, and *Artificial Intelligence* 10,561. Meanwhile, *Digital Transformation* recorded 8,939 appearances. The distribution shows that circular economy studies are increasingly connected to issues of sustainability, innovation, decision-making, MSMEs, artificial intelligence, and digital transformation. This pattern also indicates that digitalization and technology are starting to become an important part of the development of sustainability strategies and organizational innovation.



Figure 4. Top Countries by Number of Documents

Figure 4 shows the distribution of publications by country of origin. China occupies the highest position with 59,459 documents, followed by the United States with 37,989 documents, India with 35,757 documents, and the United Kingdom with 32,628 documents.

Indonesia is in fifth position with 21,618 documents, followed by Malaysia, Italy, Germany, Spain, and Australia. This pattern shows that publications on the topics analyzed have developed globally, but are still concentrated in countries with high research activities. Indonesia's inclusion in the top five also shows a fairly strong contribution from developing countries in the development of literature related to the circular economy.

Drivers of Circular Economy Capabilities

The results for RQ1 show that the formation of circular economy capabilities depends not only on technology, but also on organizational readiness, knowledge, inter-organizational relationships, governance, and institutional support. In the context of MSMEs, organizational factors and external relationships are the link between technological and environmental pressures and the decision to adopt circular practices. These findings show that technology is an enabler, while organizational readiness determines the ability of companies to convert it into circular economy practices. This pattern is in line with the findings that circular practice adoption decisions are influenced by organizational and interorganizational factors (Nguyen et al., 2026), while barriers at the design stage can slow down the adoption and diffusion of circular economy practices (Abad et al., 2026).

Circular Economy Capabilities

The results of RQ2 show that circular economy capabilities develop gradually through three skill groups, namely Foundational Innovation Capabilities, Transitional Collaboration Capabilities, and Scaling Enablement Capabilities. Organizations build foundations through technology management, product design, and process innovation, then strengthen supply chain collaboration, and expand implementation through human resources and marketing. Digitalization strengthens these processes through supply chain orchestration, Digital Product Passports, and artificial intelligence, but the benefits remain dependent on technical and organizational readiness. The pattern of these three capability groups is consistent with Ayati et al. (2026), while the role of supply chain orchestration, Digital Product Passports, AI platforms, and digital-circular pathways is supported by Panda et al. (2026), Becchi et al. (2026), Sharma et al. (2026), and Menegoli et al. (2026). Thus, circular transformation is an integrated capability-building process, not the application of technology or environmental practices separately.

Circular Economy Practices

The results of RQ3 show that circular economy practices include reduce, reuse, recovery, recycling, circular design, reverse flow, by-product utilization, and circular business model development. The pattern shows a shift from a waste management-based approach to a

business system transformation that integrates design, technology, process innovation, logistics, supplier relationships, and business models. Cross-sectoral evidence shows variations in such applications, including revalorization and frugal innovation in the automotive parts business (Alo et al., 2025), circular practices in packaging (Danvers et al., 2026), and supplier-buyer relationships to extend product life (Vellesalu et al., 2026). Circular practices are thus an operational manifestation of organizational capabilities. However, their implementation still faces obstacles in the form of limited knowledge, governance, regulation, financing, technology, time, organizational readiness, as well as obstacles at the design and diffusion stage of circular practice (Abad et al., 2026).

Sustainable Outcomes and Implications for SMEs

The results of RQ4 show that the circular economy produces environmental, economic, and organizational/strategic outcomes. The benefits identified include improved resource efficiency, reduction of waste and emissions, supply chain resilience, profitability, corporate value, and business resilience (Conca et al., 2026; Spada et al., 2025; Wangwacharakul & Sandberg, 2026). In the context of heritage tourism MSMEs, circular practices increase carbon efficiency by 37%, avoid emissions of 7.26 tCO₂e per year, and result in 99.9% waste diversion through closed-loop systems (Thuy & Thao, 2026). These findings confirm that the value of a circular economy is multidimensional and does not always appear simultaneously.

5. CONCLUSIONS AND SUGGESTIONS

This research shows that the circular economy does not only depend on the application of environmental technology or practices, but on the ability of organizations to build and integrate capabilities gradually. The main driving factors include organizational readiness, knowledge, technology, interorganizational relationships, governance, and institutional support. These capabilities develop through *innovation capabilities*, *collaboration capabilities*, and *scaling capabilities*, which are then translated into practices such as *reduction*, *reuse*, *recovery*, *recycling*, *circular design*, *reverse flow*, and *circular business models*.

The practice results in environmental, economic, and strategic benefits, including resource efficiency, reduction of waste and emissions, improved supply chain resilience, profitability, corporate value, and business resilience. The synthesis of research results in a *framework of drivers → circular economy capabilities → circular practices → sustainable outcomes*, which places organizational capabilities as the main mechanism in the transformation towards a circular economy.

The development of the circular economy in MSMEs needs to emphasize strengthening organizational capabilities through knowledge, innovation, collaboration, governance, human resources, and digital capabilities. However, because the evidence specifically addressing MSMEs is still limited, further research needs to test this framework in various MSME sectors and examine the role of resources, digital readiness, policies, and external collaboration.

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