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STRATEGIC MANAGEMENT PRACTICES FOR VALUE CHAIN OPTIMIZATION IN THE CIRCULAR ECONOMY

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ABSTRACT

This study investigates the role of strategic management practices in optimizing value chains within circular economies. Drawing on relevant scholarly papers, the research identifies six key strategic management practices crucial for circularity: long-term perspective and systems thinking, strategic sourcing and supplier collaboration, design for circularity, reverse logistics, performance measurement, and stakeholder engagement. The analysis highlights the significant differences between linear and circular business models, emphasizing the need for a strategic shift towards resource efficiency and closed-loop material use. The research concludes that while some companies are embracing circularity principles, there is a need for realignment in strategic focus. By effectively implementing these practices, businesses can unlock the full potential of circular business models and contribute to a more sustainable future.

KEYWORDS

Circular economy, strategic management, value chain optimization, circular business models

INTRODUCTION

Businesses have for the past century based their operations on the traditional linear economic model of take-make-use-dispose. This approach of conducting business has however reached a critical juncture, recording increased proportions of resource depletion and environmental degradation (Korhonen et al., 2018). In response, the circular economy (CE), which emphasizes closed-loop systems and resource recovery, has become a compelling alternative (Bakker et al., 2018). This shift necessitates a paradigm shift in the approach on strategic management practices in order to optimize value chains that operate within this new framework. Maximizing efficiency and cutting costs are the main goals of traditional value chain optimization. Traditionally, metrics like return on investment and cost per unit are prioritized (Da Costa et al., 2020). According to Genovese et al. (2017), majority of the strategic decisions made by business organizations have often prioritized its short-term needs and shareholders value. This might result in outsourcing, a focus on primary skills, and minimization of production costs. Although these components are still essential, maximizing circular value chains requires a more comprehensive approach that incorporates a number of factors among them being social and environmental factors (Masi et al., 2017).

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Even with increasing attention in the CE, a critical gap exists in our understanding of how to translate strategic management practices into effective circular value chain optimization (Da Costa et al., 2020). Existing frameworks for measuring progress towards a circular economy offer valuable guidance, but lack specific details on tailoring strategic management approaches to this new paradigm (Bakker et al., 2018). This paper seeks to address this gap to determine how businesses can be empowered as they navigate the transition towards a circular economy.

LITERATURE REVIEW

The circular economy (CE) framework transcends the traditional take-make- use-dispose model of resource use, offering a regenerative proposal for a sustainable future. Contrasting the linear model that leads depletion of resources and pollution of the environmental, the CE underscores closed-loop systems that optimizes on resource value through diverse strategies (Korhonen et al., 2018). To fully utilize strategic management in CE company models, it is important to understand the fundamental ideas and components of this said framework. The suitability of Michael Porter's (1985) value chain model for examining the shift to a CE was evaluated by Eisenreich et al. (2021), arguing that Porter's framework has significant limitations when taking CE principles into account, despite the fact that it is still widely used in strategic management.

A key criticism of Porter's model is that it does not incorporate any "reverse logistics & recovery" related tasks. Porter's value chain model reflects traditional linear business methods that more often than not, overlook the end-of-life stage of products. Eisenreich et al. (2021) contends that this category should be included as part of the main activities within the value chain, since it provides for key activities that are necessary to enable the closing the loop in a circular economy. The key activities included in reverse logistics and recovery include product collection, disassembly, refurbishment, remanufacturing, and recycling (Kalmykova et al., 2018). The integration of this stage within the value chain architecture emphasizes the vital role it plays in enabling multiple product life cycles, which is a fundamental component of the CE.

An additional criticism focuses on Porter's model's little attention to relationships both inside and outside the value chain. While Porter acknowledges interfaces between activities and linkages to external stakeholders, his primary focus remains on optimizing individual value chain categories for competitive advantage (Porter, 1985). It is however necessary that, at every stage of the value chain, firms embrace increased collaboration with external stakeholders including distributors, suppliers, and customers as this will enhance the chances of successful transition to a circular economy. According to De Angelis et al. (2018), the framework should graphically illustrate these interactions in order to highlight their critical importance in the implementation of CE, therefore recommending that the traditional business models need to be adjusted for the circular economy. While Porter's value chain model provides a valuable foundation for understanding business operations, it requires adjustments to fully comprehend the complexities of a circular system. Integrating reverse logistics & recovery activities, adopting a circular representation, and emphasizing interconnections are crucial steps towards a more comprehensive framework for analyzing and implementing a circular economy (De los Rios, Charnley, 2017).

Eisenreich et al. (2021) further argue that the linear structure of Porter's model fails to capture the essence of a circular economy. Porter's framework reflects a "cradle-to-grave" mentality, assuming a single product life cycle with disposal as the end point. In contrast, CE embraces "cradle-to-cradle" principles, aiming to keep

products and materials in use for as long as possible. They suggest modifying the graphical representation to depict the primary activities in a circular fashion as illustrated in Figure 1.

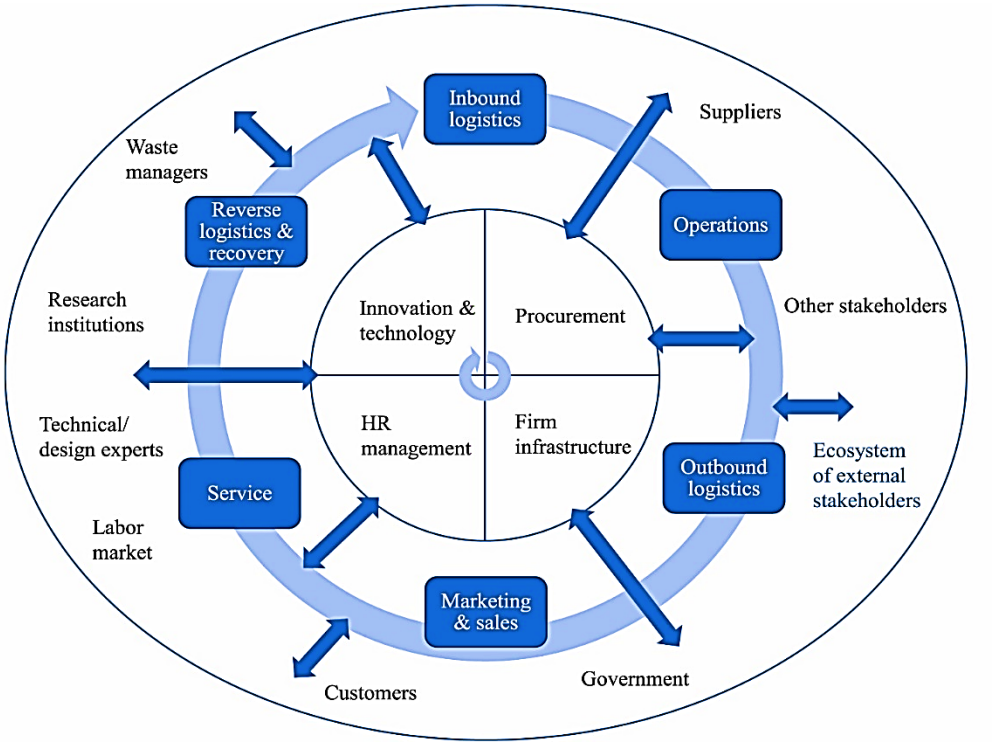

Figure 1. Circular Economy Value Chain Model
Source: Eisenreich et. al., 2022

Circular value chain optimization necessitates a strategic shift towards a "Triple Bottom Line" approach, balancing economic, environmental, and social aspects (Genovese et al., 2017). This requires expanding traditional financial metrics to incorporate additional circular economy metrics. Life cycle assessments (LCA) and resource recovery rates become crucial for evaluating the environmental impact of products and processes (Da Costa et al., 2020). Strategic decision-making in the CE context prioritizes resource efficiency, waste reduction, and extending product lifespans (Bakker et al., 2018). Collaboration with stakeholders throughout the value chain becomes central for establishing efficient closed-loop systems for resource recovery and reuse (Hofmann, Jaeger-Erben, 2020).

Strategic management is a comprehensive approach to formulating, implementing, and evaluating decisions that enable an organization to achieve its objectives. The concept involves the integration of various management practices, including strategic planning, resource allocation, and performance monitoring, to steer an organization towards its long-term goals. At its core, strategic management is about positioning an organization effectively within its environment, leveraging its strengths, mitigating its weaknesses, and navigating through threats and opportunities (Porter, 1985). This process requires a clear understanding of the external environment and internal capabilities, as well as the ability to adapt to changes and maintain a competitive edge.

The modern business landscape is characterized by unprecedented levels of uncertainty and change, driven by factors such as digital transformation, economic fluctuations, and socio-political shifts. In response, contemporary strategic management practices have become more iterative and inclusive,

incorporating real-time data analysis, scenario planning, and stakeholder engagement (Teece et al., 1997). Organizations are increasingly recognizing the importance of agility, resilience, and sustainability in their strategic approaches. This shift underscores the necessity for strategic management to not only focus on competitive advantage but also on creating long-term value and ensuring organizational sustainability in a rapidly evolving environment. In the context of the circular economy (CE), strategic management plays a critical role in optimizing value chains and fostering a sustainable future (Svensson, Funck, 2019). However, the traditional, static approaches to strategy formulation are ill-suited for the dynamic and interconnected nature of the CE.

The transition towards a circular economy necessitates a paradigm shift in how we approach resource management and product lifecycles. Three key theoretical perspectives illuminate different aspects of this transformation. Systems thinking provides a framework for understanding the interconnectedness between various actors and processes within the circular economy (Linder, Williander, 2017). The product life cycle theory highlights the limitations of the traditional "take-make-dispose" model and emphasizes the need for extending product lifespans and considering end-of-life options (Awan et al., 2021). Finally, dynamic capabilities theory explores how businesses can develop the adaptability and innovation required to thrive in a circular economy (Bocken et al., 2016). These three theories, each offering a unique lens, contribute to a comprehensive understanding of the evolving landscape of resource management within a circular system.

METHODOLOGY

This research employed a systematic literature review (SLR) methodology to explore the influence of strategic management practices on value chain optimization within the CE framework. An SLR offers a rigorous and transparent approach for identifying relevant academic publications through a predefined search strategy and inclusion/exclusion criteria (Tranfield, Denyer, Smart, 2003)

A comprehensive search of three primary academic databases (Elsevier, Google Scholar, and ResearchGate) was conducted. To ensure comprehensiveness, a pilot search was initially conducted with a smaller set of terms to refine the final search string. Boolean operators ("AND," "OR," "NOT") were then utilized to combine search terms related to the three core concepts:

- Strategic Management: "strategic management," "strategic business practices," "business model innovation".
- Circular Economy: "circular economy," "circular business models".
- Value Chain Optimization: "value chain optimization," "circular value chains," "closed-loop supply chain".

This search strategy aimed to capture relevant articles that explicitly address the intersection of these three domains.

A two-stage screening process was implemented to refine the initial search results. Articles were included based on the following criteria:

- **Publication Date**: Published within the last 15 years (2009-2024) to ensure the incorporation of recent advancements in the field.

- **Publication Type:** Peer-reviewed academic journals with a high impact factor to maintain the credibility and quality of the research. Additional quality assessment criteria, such as author reputation and methodological rigor, may be considered during the screening process.
- **Language**: Written in English for accessibility and consistency during analysis.
- **Content Focus**: Explicitly address the relationship between strategic management practices, value chain optimization, and the circular economy.

Articles that did not meet these criteria were excluded from the review process.

Following the search strategy and applying the inclusion/exclusion criteria, relevant articles were retrieved and stored in a reference management software for efficient organization. A standardized data extraction form was developed to capture key information from each article, such as:

- Author(s) and publication year
- Title and abstract
- Specific strategic management practices explored
- Value chain optimization approaches within a circular economy context
- Theoretical frameworks or models presented

A thematic analysis was employed to analyze the extracted data. This qualitative approach involved a systematic coding process to identify recurring themes and categorize the articles based on the specific strategic management practices explored in the context of circular economy and value chain optimization. Thematic saturation, the point where no new themes emerge from additional articles, was used to determine the completion of the analysis. The results of this thematic analysis will be presented in detail in a subsequent section.

DISCUSSION

The synthesis of findings from a review of scholarly works on strategic management and value chain optimization in circular economies reveals a growing body of research dedicated to transforming traditional linear models into sustainable, circular ones. Scholars such as Geissdoerfer et al. (2017) and Kirchherr et al. (2018) have extensively explored the theoretical underpinnings of circular economy principles, highlighting the necessity of integrating economic, environmental, and social dimensions into business strategies. These studies emphasize the holistic nature of circular value chains, which require a comprehensive understanding of the entire lifecycle of products and the interconnectedness of various components within the value chain. Research has also delved into practical applications and strategic management practices essential for optimizing circular value chains. For instance, Lieder and Rashid (2016) provide a thorough examination of the implementation challenges and opportunities in the manufacturing sector, while Eisenreich et al. (2021) focus on product design and business model strategies that facilitate circularity. The table below highlights a selection of scholarly works that address the concept of strategic management and value chain optimization in the circular economy.

Table 1: Selection of scholarly works focusing on the concept of strategic management and value chain optimization in the circular economy.

Study	Authors	Key Focus	Key Findings
Towards the Circular Economy: Economic and business rationale for an accelerated transition	Ellen MacArthur Foundation (2013)	Business case for circular economy	Circular economy offers economic benefits beyond environmental sustainability, such as cost savings from resource efficiency and new market opportunities.
A framework for measuring progress towards a circular economy	Bakker, C., et al. (2018)	Measuring circularity	Proposes a framework with various metrics to track progress towards circularity, including resource recovery rates and closed-loop material use.
Product life extension – a review of incentives and barriers for consumer repair and product service systems	Bocken, A. M., Bakker, C., & Pauw, I. (2016)	Product design and consumer behavior	Highlights the importance of product design for disassembly and repair, alongside consumer education and incentives for extending product lifespans.
Redefining the circular economy: circularity by design	Bracken, P., Murray, A., & Bryson, A. (2019)	Systemic approach to circularity	Emphasizes the need for a systemic approach to circular economy, moving beyond individual stages of the value chain and focusing on design for circularity.
The Circular Economy: A new sustainability paradigm?	Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017)	Shifting from linear to circular models	Analyzes the conceptual shift from linear to circular models in value chains, highlighting the need for new strategic management practices.
Measuring circular economy performance: A new tool integrating environmental and economic assessments	Sauvé, S., Bernard, S., & Sloan, P. (2016)	Performance measurement for circularity	Proposes a new performance measurement tool that integrates environmental and economic assessments to track progress towards circular economy.
New business models for product service systems – a sketch	Tukker, A., (2015)	Business model innovation for circularity	Explores business model innovation for circularity, emphasizing product-as-a-service models that decouple ownership from product use.
A review of methods for design for disassembly and recyclability in end-of-life product management	Prieto-Flores et al. (2019)	Design for disassembly and recyclability	Reviews various design methods that facilitate product disassembly and recyclability, crucial for circular value chains.
Thinking in systems: A primer	Kirchherr, J.; Reike, D.; Hekkert, M. (2017)	Systems thinking for circular economy	Emphasizes the importance of systems thinking in circular economy, understanding the interconnectedness of actors and processes within the value chain.

Source: Author, 2024.

The synthesis of these findings underscores the critical role of strategic sourcing, supplier collaborations, design for circularity, reverse logistics, performance measurement, and stakeholder engagement in achieving a sustainable circular economy.

This table below summarizes the key strategic management practices identified that are key for optimizing circular value chains, along with the corresponding studies that address each practice.

Table 2. Key strategic management practices for value chain optimization in circular value chains

Strategic Management Practice	**Scholarly References**
Long-Term Perspective & Systems Thinking	Bakker et al. (2018); Bracken et al. (2019), Sarja et al. (2021)
Strategic Sourcing & Supplier Collaboration	Bocken et al. (2016); Ellen MacArthur Foundation (2013); Alhawari et al. (2021)
Design for Circularity	Bracken et al. (2019); Prieto-Flores et al. (2019); Tukker (2015)
Reverse Logistics & Recovery Strategies	Govindan & Hasanagic (2018); Kirchherr et al. (2017)
Performance Measurement	Bakker et al. (2018); Govindan & Hasanagic (2018)
Stakeholder Engagement	Bocken et al. (2016); Ellen MacArthur Foundation (2013); Kirchherr et al. (2017)

Source: Author, 2024

Long perspective and system thinking are regarded as strategic management practices because they enable organizations to navigate complex and dynamic environments by focusing on long-term sustainability and recognizing the interconnectedness of various elements within the business ecosystem. Kirchherr, Reike and Hekkert (2017) argue that adopting a long-term perspective helps businesses "anticipate future resource constraints and market demands" (p. 222), which is essential for strategic planning and sustainability. This forward-thinking approach allows companies to invest in sustainable practices that yield benefits over time, rather than focusing solely on short-term profits. Similarly, Geissdoerfer et al. (2017) emphasize that "system thinking enables organizations to identify and leverage the synergies between economic, environmental, and social dimensions of sustainability" (p. 759). By recognizing these interconnections, businesses can make more informed strategic decisions that enhance overall sustainability and resilience.

In a circular business model, long perspective and system thinking are put into practice in several ways. According to Ellen MacArthur Foundation (2013), companies adopt lifecycle thinking to design products that are durable, repairable, and recyclable. This involves considering the entire lifecycle of a product, from raw material extraction to end-of-life disposal, and designing for longevity and easy disassembly. This helps firms to focus on the long-term use and reuse of products, thus reducing waste and extending the value of materials. Lieder & Rashid further argue that system thinking encourages businesses to optimize resource use by creating closed-loop systems where materials are continually reused and recycled. This can involve setting up take-back programs and reverse logistics to reclaim end-of-life products and reintegrate them into the production process (Lieder, Rashid, 2016).

Strategic sourcing involves the deliberate selection and management of suppliers based on long-term objectives and sustainability criteria. This practice ensures that companies secure high-quality, sustainable, and recyclable materials, which are foundational for a circular economy. Linear business models typically engage in transactional relationships with suppliers, focusing primarily on cost reduction and efficiency rather than sustainability. Supplier selection is often based on the lowest bid, with little consideration for the environmental or social impacts of procurement decisions. Innovation is limited to incremental improvements in cost or efficiency, rather than transformative changes aimed at sustainability. Geng et al. (2012) however highlights that strategic sourcing "ensures the quality and sustainability of inputs" (p. 220), which is critical for maintaining a competitive edge and achieving long-term sustainability goals.

Similarly, collaborating with suppliers is essential for co-developing new materials and technologies, optimizing supply chain processes, and ensuring mutual growth. In linear models, there is often a lack of integration and collaboration with suppliers, resulting in missed opportunities for joint innovation and the development of sustainable practices. The supply chain operates in silos, with minimal information sharing or coordination between different stages of the value chain. This limits the ability to implement closed-loop systems and recover materials effectively. Lieder and Rashid (2016) emphasize that supplier collaborations "can lead to the co-development of new materials and technologies that are essential for closing the loop in product lifecycles" (p. 40). Supplier collaboration aligns with strategic management by fostering innovation, enhancing supply chain resilience, and creating shared value for all stakeholders.

Designing for circularity is a key strategic management practice because it fundamentally transforms the product lifecycle to prioritize sustainability and resource efficiency in circular business models. It moves beyond the traditional linear model's focus on creating products for single-use and disposal. Instead, it prioritizes designing products with their entire lifecycle in mind, aiming to keep resources in use for as long as possible (Geissdoerfer et al., 2017). The Ellen MacArthur Foundation (2013) highlights that "designing products with their end-of-life in mind is a key principle of the circular economy." Bocken et al. (2016) add that modular design and design for disassembly are strategies that enable companies to "extend the lifecycle of products, thereby reducing the need for virgin materials."

Reverse logistics, often referred to as the "aftermarket supply chain," plays a critical role in circular business models (Lieder & Rashid, 2016). It's the strategic practice of managing the movement of goods from their point of consumption back up the value chain (Genovese et al., 2017). This goes beyond simply handling product returns – it encompasses the entire process of collecting, sorting, and reintegrating used products or materials into the production cycle for reuse, refurbishment, or recycling. Scholars like Jonker and Montenegro Navarro (2018) highlight the strategic importance of reverse logistics for several reasons. Firstly, it enables companies to capture value from used products. By collecting and remanufacturing returned goods, businesses can extend product lifespans, reduce reliance on virgin materials, and potentially create new revenue streams. Secondly, robust reverse logistics networks contribute to a company's environmental sustainability efforts. By diverting used products from landfills and promoting material recovery, businesses can minimize their environmental footprint and align with circular economy principles. Finally, efficient reverse logistics operations enhance customer satisfaction. Take-back programs and easy return options foster customer loyalty and encourage responsible product use.

In the context of circular business models, stakeholder engagement transcends mere communication. It becomes a strategic management practice that fosters collaboration and shared value creation (Jonker & Montenegro Navarro, 2018). As Bocken et al. (2016) point out, actively engaging stakeholders in the development and implementation of circular strategies is crucial for ensuring their acceptance and

support. This is so important because circular business models often disrupt traditional value chains, requiring cooperation across various actors in the system. Suppliers may need to source recycled materials, consumers might need to adopt new product usage habits, and policymakers may need to create supportive regulations. Effective stakeholder engagement creates a platform for open dialogue and collaboration, allowing businesses to address potential concerns and identify opportunities for mutual benefit.

Performance measurement in a circular economy context requires metrics that go beyond traditional financial indicators to include environmental and social dimensions. Geng et al. (2012) suggest that "developing comprehensive indicators for circular economy performance is critical for tracking progress and identifying areas for improvement" (p. 222). Sauvé, Bernard, and Sloan (2016) advocate for integrating metrics such as resource efficiency, waste reduction, and carbon footprint into the performance measurement framework. Scholars like Geng et al. (2012) and Sauvé, Bernard, and Sloan (2016) emphasize the strategic importance of performance measurement in circular economies. It provides businesses with a crucial tool for:

1) Tracking Progress where by establishing clear metrics, companies can monitor their progress towards circularity goals, and this data can reveal areas for improvement and inform strategic decision-making.
2) Demonstrating Transparency whereby adopting robust performance measurement systems allow businesses to communicate their environmental and social impact transparently to stakeholders which fosters trust and strengthens brand reputation.
3) Benchmarking and Improvement whereby circular economy metrics enable companies to compare their performance against industry benchmarks and identify best practices for continual improvement.

CONCLUSION

The investigation of the literature on strategic management practices in CE reveals several key insights. Firstly, it is clear that strategic management practices are not merely adaptable to a circular economy; they are fundamental to its success. The findings high-lights the critical role of these practices in optimizing circular value chains. Design for circularity, reverse logistics, performance measurement, and stakeholder engagement, as identified by this analysis, are not merely operational considerations, but strategic choices that influence a company's entire approach to resource management and business success within a circular economy.

The research also underscores the significant differences between linear and circular business models. Linear models, with their focus on short-term profit maximization and single-use products, necessitate a different set of strategic priorities compared to circular models. Circular models, on the other hand, require a long-term perspective that prioritizes resource efficiency, closed-loop material use, and collaboration across the value chain. This necessitates a shift in strategic management practices to ensure alignment with these new goals.

The question then arises: are current strategic management practices being employed effectively in the context of circular business models? While there are certainly examples of companies embracing circularity principles, there is also evidence that some businesses struggle to fully integrate these

practices into their existing strategies. A key challenge lies in overcoming traditional mindsets focused on linear models and production efficiency.

To achieve true value chain optimization in a circular economy, companies need to realign their strategic focus in several key areas. Firstly, design for circularity must become a core principle, with products designed for disassembly, repair, and material recovery. Secondly, robust reverse logistics networks are essential to collect and reintegrate used products back into the production cycle. Thirdly, implementing a comprehensive performance measurement system that captures environmental and social impacts alongside financial metrics is crucial for tracking progress and informing strategic decisions. Finally, prioritizing stakeholder engagement through open communication and collaboration with all actors in the value chain fosters innovation and shared value creation.

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