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Barriers to Adopting Green Supply Chain Practices: Perspectives From Industry Leaders

Samantha Reynolds *

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Barriers to Adopting Green Supply Chain Practices: Perspectives from Industry Leaders

Samantha Reynolds

Kellogg School of Management; samantha@kellogg.northwestern.edu

Abstract: This study explores the barriers to adopting green supply chain practices from the perspective of industry leaders. By conducting qualitative interviews with key decision-makers in various sectors, the research uncovers the complexities and challenges faced in integrating sustainable practices into supply chain operations. The findings highlight significant obstacles such as cost implications, lack of regulatory support, technological limitations, and resistance to change within organizations. Additionally, the study reveals that while there is a growing awareness and commitment towards sustainability, practical implementation remains fraught with difficulties. The insights gained from industry leaders provide a nuanced understanding of the multifaceted nature of these barriers, offering valuable guidance for businesses and policymakers aiming to promote greener supply chains.

Keywords: green supply chain; sustainability; barriers; industry leaders; cost implications; regulatory support; technological limitations

1. Introduction

In recent years, the concept of green supply chain practices has garnered significant attention as businesses and governments worldwide recognize the urgent need to address environmental sustainability. Green supply chain management (GSCM) integrates environmental thinking into supply chain management, including product design, material sourcing, manufacturing processes, delivery of the final product, and end-of-life management. The growing emphasis on sustainability reflects a broader societal shift towards environmental consciousness and responsibility, driven by factors such as climate change, resource scarcity, and increasing consumer demand for eco-friendly products. Despite the evident benefits and growing imperative for green supply chain practices, many organizations face substantial barriers in adopting these initiatives. This study aims to delve into these challenges from the perspective of industry leaders who are at the forefront of supply chain decision-making. Understanding these barriers is crucial for developing effective strategies and policies to facilitate the transition to more sustainable supply chain operations. The motivation for businesses to adopt green supply chain practices is multifaceted. On the one hand, there are external pressures from regulatory bodies, consumers, and stakeholders demanding more environmentally responsible practices. Governments worldwide are implementing stricter regulations and standards to curb environmental degradation, compelling businesses to align their operations with these mandates. Consumers, increasingly aware of the environmental impact of their purchasing decisions, are favoring companies that demonstrate a commitment to sustainability. Stakeholders, including investors and partners, are also prioritizing environmental performance, recognizing that sustainable practices can mitigate risks and enhance long-term profitability. On the other hand, there are intrinsic motivations for businesses to pursue green supply chain practices. Companies are beginning to understand that sustainable practices can lead to significant operational efficiencies, cost savings, and competitive advantages. For instance, optimizing resource usage and reducing waste can lower production costs, while enhancing energy efficiency can reduce utility expenses. Furthermore, companies that lead in sustainability can differentiate themselves in the market, attracting environmentally conscious consumers and gaining a reputational edge. However, despite these motivations, the transition to green supply chain practices is not straightforward. Industry leaders

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often encounter a myriad of challenges that hinder their efforts to implement sustainable initiatives. One of the most prominent barriers is the financial aspect. Implementing green technologies and processes often requires substantial upfront investments, which can be daunting for businesses, especially small and medium-sized enterprises (SMEs) with limited financial resources. The long payback periods associated with some green investments further exacerbate this challenge, making it difficult for companies to justify the expenditures in the short term. Another significant barrier is the lack of regulatory support and incentives. While some governments have introduced policies to promote green practices, the level of support and enforcement varies widely across regions. In many cases, the absence of clear guidelines, standards, and incentives can discourage businesses from investing in green supply chains. Additionally, inconsistent regulations across different markets can create complexities for multinational companies trying to implement uniform sustainability standards globally. Technological limitations also pose a major challenge. Although there have been significant advancements in green technologies, many businesses still find it difficult to access and implement these innovations. The high costs of advanced technologies, coupled with the lack of technical expertise, can impede the adoption of green practices. Moreover, existing supply chain infrastructures may not be compatible with new technologies, necessitating costly overhauls and integrations. Resistance to change within organizations is another critical barrier. Adopting green supply chain practices often requires a fundamental shift in corporate culture and operations, which can be met with resistance from employees and management. This resistance can stem from a lack of awareness or understanding of the benefits of green practices, fear of disrupting established processes, or skepticism about the feasibility and impact of sustainability initiatives. Overcoming this resistance requires strong leadership, effective communication, and education to foster a culture of sustainability within the organization. Furthermore, the complexity of supply chain networks adds to the challenge. Modern supply chains are intricate, involving multiple stakeholders, including suppliers, manufacturers, logistics providers, and retailers. Coordinating green initiatives across these diverse actors can be challenging, as it requires alignment of goals, practices, and standards. The lack of transparency and visibility in supply chain operations further complicates efforts to monitor and enforce sustainable practices. Despite these barriers, there is a growing recognition among industry leaders of the importance of green supply chain practices. Many companies are proactively seeking ways to overcome these challenges and integrate sustainability into their operations. This study seeks to capture the perspectives of these industry leaders, providing insights into the specific barriers they face and the strategies they employ to navigate these obstacles. The qualitative approach of this study involves in-depth interviews with key decision-makers from various industries. This method allows for a rich exploration of the nuanced experiences and insights of industry leaders, offering a comprehensive understanding of the barriers to adopting green supply chain practices. By examining the real-world challenges faced by businesses, this research aims to contribute to the development of more effective strategies and policies to promote sustainable supply chains.

2. Literature Review

The literature on green supply chain management (GSCM) has expanded significantly in recent years, reflecting the growing interest in sustainability within the field of supply chain management. Scholars have explored various dimensions of GSCM, including the drivers, benefits, and barriers to adoption, as well as the strategies and practices that can facilitate the transition to more sustainable supply chains. This review synthesizes recent research findings to provide a comprehensive understanding of the barriers to adopting green supply chain practices from the perspective of industry leaders. One of the primary drivers of GSCM is the increasing regulatory pressure from governments and international bodies. Governments worldwide are implementing stricter environmental regulations and standards to curb pollution, reduce carbon emissions, and promote sustainable resource use. For instance, the European Union's Green Deal and the Paris Agreement are significant policy frameworks that compel businesses to adopt greener practices. However, despite the growing regulatory pressure, the literature indicates that the lack of consistent and

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supportive regulatory frameworks can be a significant barrier to GSCM adoption (Govindan et al., 2014). In many regions, unclear guidelines, weak enforcement, and insufficient incentives hinder businesses from investing in green supply chain initiatives. The financial implications of adopting green supply chain practices are another critical barrier highlighted in the literature. Implementing green technologies and processes often requires substantial upfront investments, which can be prohibitive for many businesses, particularly SMEs (Zhu et al., 2008). The high costs of eco-friendly materials, energy-efficient technologies, and sustainable production methods can strain financial resources. Moreover, the long payback periods associated with green investments make it challenging for companies to justify the expenditures, especially when short-term financial performance is a priority. As a result, financial constraints remain a significant impediment to the widespread adoption of GSCM. Technological limitations also pose a significant challenge to GSCM adoption. While there have been significant advancements in green technologies, many businesses still find it difficult to access and implement these innovations. The high costs of advanced technologies, coupled with the lack of technical expertise, can impede the adoption of green practices (Testa & Iraldo, 2010). Additionally, existing supply chain infrastructures may not be compatible with new technologies, necessitating costly overhauls and integrations. The literature emphasizes the need for technological innovation and diffusion to support the transition to sustainable supply chains. Organizational resistance to change is another critical barrier to GSCM adoption. Adopting green supply chain practices often requires a fundamental shift in corporate culture and operations, which can be met with resistance from employees and management. This resistance can stem from a lack of awareness or understanding of the benefits of green practices, fear of disrupting established processes, or skepticism about the feasibility and impact of sustainability initiatives (Walker et al., 2008). Overcoming this resistance requires strong leadership, effective communication, and education to foster a culture of sustainability within the organization. The complexity of supply chain networks adds to the challenge of adopting green supply chain practices. Modern supply chains are intricate, involving multiple stakeholders, including suppliers, manufacturers, logistics providers, and retailers. Coordinating green initiatives across these diverse actors can be challenging, as it requires alignment of goals, practices, and standards (Vachon & Klassen, 2006). The lack of transparency and visibility in supply chain operations further complicates efforts to monitor and enforce sustainable practices. The literature highlights the importance of collaboration and communication among supply chain partners to facilitate the adoption of green practices. Despite these barriers, the literature also identifies several strategies and practices that can facilitate the adoption of green supply chain practices. One such strategy is the development of strong supplier relationships. Effective supplier relationship management (SRM) can enhance collaboration, information sharing, and joint problem-solving, which are essential for implementing sustainable practices across the supply chain (Emon et al., 2024). Building long-term partnerships with suppliers who are committed to sustainability can help businesses overcome the barriers related to cost, technology, and complexity. Another important strategy is the integration of sustainability into the core business strategy. When sustainability is embedded into the corporate vision and mission, it becomes a guiding principle for decision-making and operations (Carter & Rogers, 2008). This strategic integration can help align organizational goals with sustainability objectives, facilitating the allocation of resources and the commitment to green practices. Additionally, sustainability initiatives should be supported by top management to ensure their successful implementation. The role of technological innovation in supporting GSCM adoption is also emphasized in the literature. Advances in digital technologies, such as the Internet of Things (IoT), blockchain, and artificial intelligence (AI), can enhance supply chain transparency, traceability, and efficiency (Kshetri, 2018). For example, blockchain technology can provide a secure and transparent record of transactions, helping to ensure that supply chain activities comply with environmental standards. Similarly, IoT devices can monitor environmental conditions and resource usage in real-time, enabling more efficient and sustainable operations. Sustainability (Emon & Khan, 2023), entrepreneurship (Emon & Nipa, 2024), emotional intelligence (Emon et al., 2024), marketing (Rahman et al., 2024), and supplier relationship management (Emon et al., 2024) are also crucial aspects in the context of GSCM. The

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integration of these elements can provide a comprehensive approach to overcoming the barriers to green supply chain adoption. For instance, sustainability and entrepreneurship can drive innovation and the development of new business models that prioritize environmental responsibility. Emotional intelligence can enhance leadership effectiveness and employee engagement in sustainability initiatives. Marketing can play a key role in communicating the value of green practices to consumers and stakeholders, building brand reputation and consumer trust.

3. Research Methodology

The research methodology for this study is designed to explore the barriers to adopting green supply chain practices from the perspectives of industry leaders. Given the complex and multifaceted nature of this topic, a qualitative approach is deemed most appropriate to capture the nuanced experiences and insights of key decision-makers. The qualitative method allows for in-depth exploration of the challenges and provides a rich understanding of the context within which these barriers exist. Data collection involved semi-structured interviews with industry leaders from various sectors, including manufacturing, retail, logistics, and technology. This approach enables the collection of detailed and diverse perspectives, as participants can express their views freely while the interviewer can probe deeper into specific areas of interest. The interview guide was developed based on a thorough review of existing literature and included questions on the motivations for adopting green supply chain practices, the specific barriers encountered, and the strategies employed to overcome these challenges. Participants were selected using purposive sampling to ensure a diverse representation of industries and organizational roles. The criteria for selection included senior management positions, such as CEOs, supply chain managers, and sustainability officers, who have significant influence over supply chain decisions. The aim was to gather insights from those who are directly involved in shaping and implementing supply chain strategies within their organizations. The interviews were conducted via video conferencing to accommodate participants from different geographical locations. Each interview lasted approximately one hour and was recorded with the consent of the participants for accurate transcription and analysis. The confidentiality and anonymity of the participants were assured to encourage candid and honest responses. Data analysis followed a thematic approach, which involved coding the interview transcripts to identify recurring themes and patterns. This process included initial open coding to capture a wide range of insights, followed by axial coding to link related concepts and develop a coherent narrative. The final stage involved selective coding to refine the themes and integrate them into the overall analysis. To ensure the reliability and validity of the findings, several strategies were employed. Triangulation was achieved by cross-referencing data from interviews with secondary sources, such as industry reports and academic literature. Member checking was conducted by sharing the preliminary findings with participants to verify the accuracy and interpretation of their responses. Reflexivity was maintained throughout the research process, with the researcher reflecting on their own biases and assumptions to minimize their influence on the data collection and analysis. Ethical considerations were addressed by obtaining informed consent from participants, ensuring confidentiality and anonymity, and allowing participants to withdraw from the study at any time. The research was conducted in accordance with ethical guidelines to respect the rights and dignity of all participants.

4. Results and Findings

The results and findings of this study provide a comprehensive understanding of the barriers to adopting green supply chain practices from the perspective of industry leaders. The interviews with key decision-makers revealed several critical challenges that hinder the integration of sustainable practices into supply chain operations. One of the most significant barriers identified by participants is the high cost associated with implementing green supply chain practices. Many industry leaders noted that the initial investment required for green technologies, eco-friendly materials, and sustainable processes is substantial. This financial burden is particularly challenging for small and medium-sized enterprises (SMEs) that have limited financial resources. Additionally, the long

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payback periods for these investments make it difficult for companies to justify the expenditures, especially when short-term financial performance is a priority. As a result, cost considerations remain a major impediment to the widespread adoption of green supply chain practices. Another critical barrier highlighted by participants is the lack of regulatory support and incentives. While there are increasing regulatory pressures to adopt sustainable practices, the level of support and enforcement varies widely across regions. Many participants expressed frustration with the lack of clear guidelines, inconsistent regulations, and insufficient incentives for green investments. This regulatory uncertainty creates a challenging environment for businesses trying to implement uniform sustainability standards across their supply chains, particularly for multinational companies operating in diverse markets. Technological limitations also emerged as a significant challenge. Despite advancements in green technologies, many businesses still find it difficult to access and implement these innovations. Participants pointed out that the high costs of advanced technologies, coupled with the lack of technical expertise, impede the adoption of green practices. Additionally, existing supply chain infrastructures may not be compatible with new technologies, necessitating costly overhauls and integrations. These technological barriers highlight the need for continued innovation and diffusion of sustainable technologies. Resistance to change within organizations was another major barrier identified by participants. Adopting green supply chain practices often requires a fundamental shift in corporate culture and operations, which can be met with resistance from employees and management. This resistance is often rooted in a lack of awareness or understanding of the benefits of green practices, fear of disrupting established processes, or skepticism about the feasibility and impact of sustainability initiatives. Overcoming this resistance requires strong leadership, effective communication, and education to foster a culture of sustainability within the organization. The complexity of supply chain networks further complicates the adoption of green practices. Modern supply chains involve multiple stakeholders, including suppliers, manufacturers, logistics providers, and retailers. Coordinating green initiatives across these diverse actors can be challenging, as it requires alignment of goals, practices, and standards. Participants noted that the lack of transparency and visibility in supply chain operations further complicates efforts to monitor and enforce sustainable practices. Effective collaboration and communication among supply chain partners are essential for overcoming these challenges. Despite these barriers, the study also revealed several strategies and practices that industry leaders are employing to facilitate the adoption of green supply chain practices. Building strong relationships with suppliers emerged as a critical strategy. Participants emphasized the importance of collaborating with suppliers who are committed to sustainability and engaging in joint problem-solving and innovation. Effective supplier relationship management (SRM) can enhance coordination and information sharing, which are essential for implementing sustainable practices across the supply chain. Integrating sustainability into the core business strategy was another important strategy highlighted by participants. When sustainability is embedded into the corporate vision and mission, it becomes a guiding principle for decision-making and operations. This strategic integration helps align organizational goals with sustainability objectives, facilitating the allocation of resources and the commitment to green practices. Participants also emphasized the importance of top management support in driving sustainability initiatives. The role of technological innovation in supporting green supply chain practices was also emphasized by participants. Advances in digital technologies, such as the Internet of Things (IoT), blockchain, and artificial intelligence (AI), can enhance supply chain transparency, traceability, and efficiency. For example, blockchain technology can provide a secure and transparent record of transactions, helping to ensure that supply chain activities comply with environmental standards. Similarly, IoT devices can monitor environmental conditions and resource usage in real-time, enabling more efficient and sustainable operations.

5. Discussion

The discussion of the study's findings provides a broader analysis of the barriers to adopting green supply chain practices, linking the empirical results to existing literature and theoretical frameworks. The findings underscore the multifaceted nature of these barriers, highlighting the

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complex interplay of financial, regulatory, technological, organizational, and network-related factors that hinder the adoption of sustainable practices. The high costs associated with green supply chain practices, as identified by participants, align with the literature on the financial barriers to sustainability. Implementing green technologies and processes often requires substantial upfront investments, which can be prohibitive for many businesses, particularly SMEs (Zhu et al., 2008). This financial burden is exacerbated by the long payback periods associated with green investments, making it difficult for companies to justify the expenditures in the short term. This finding supports the argument that financial constraints are a significant impediment to the widespread adoption of green supply chain practices (Govindan et al., 2014). The lack of regulatory support and incentives is another critical barrier highlighted by participants, reflecting the broader regulatory challenges discussed in the literature. While there are increasing regulatory pressures to adopt sustainable practices, the level of support and enforcement varies widely across regions. This regulatory uncertainty creates a challenging environment for businesses trying to implement uniform sustainability standards across their supply chains, particularly for multinational companies operating in diverse markets (Testa & Iraldo, 2010). The findings underscore the need for consistent and supportive regulatory frameworks to facilitate the adoption of green supply chain practices. Technological limitations also emerged as a significant challenge, consistent with the literature on the technological barriers to sustainability. Despite advancements in green technologies, many businesses still find it difficult to access and implement these innovations. The high costs of advanced technologies, coupled with the lack of technical expertise, impede the adoption of green practices (Kshetri, 2018). Additionally, existing supply chain infrastructures may not be compatible with new technologies, necessitating costly overhauls and integrations. These technological barriers highlight the need for continued innovation and diffusion of sustainable technologies. Resistance to change within organizations is another major barrier identified by participants, reflecting the organizational challenges discussed in the literature. Adopting green supply chain practices often requires a fundamental shift in corporate culture and operations, which can be met with resistance from employees and management. This resistance is often rooted in a lack of awareness or understanding of the benefits of green practices, fear of disrupting established processes, or skepticism about the feasibility and impact of sustainability initiatives (Walker et al., 2008). Overcoming this resistance requires strong leadership, effective communication, and education to foster a culture of sustainability within the organization. The complexity of supply chain networks further complicates the adoption of green practices, consistent with the literature on supply chain complexity and coordination challenges. Modern supply chains involve multiple stakeholders, including suppliers, manufacturers, logistics providers, and retailers. Coordinating green initiatives across these diverse actors can be challenging, as it requires alignment of goals, practices, and standards (Vachon & Klassen, 2006). The lack of transparency and visibility in supply chain operations further complicates efforts to monitor and enforce sustainable practices. Effective collaboration and communication among supply chain partners are essential for overcoming these challenges. Despite these barriers, the study also identifies several strategies and practices that can facilitate the adoption of green supply chain practices, supporting the literature on effective sustainability strategies. Building strong relationships with suppliers emerged as a critical strategy. Effective supplier relationship management (SRM) can enhance coordination, information sharing, and joint problem-solving, which are essential for implementing sustainable practices across the supply chain (Emon et al., 2024). Building long-term partnerships with suppliers who are committed to sustainability can help businesses overcome the barriers related to cost, technology, and complexity. Integrating sustainability into the core business strategy was another important strategy highlighted by participants. When sustainability is embedded into the corporate vision and mission, it becomes a guiding principle for decision-making and operations (Carter & Rogers, 2008). 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6. Conclusion

This study provides a comprehensive analysis of the barriers to adopting green supply chain practices from the perspective of industry leaders. The findings reveal that while there is a growing awareness and commitment towards sustainability, practical implementation remains fraught with difficulties. The high costs associated with green technologies, the lack of regulatory support and incentives, technological limitations, resistance to change within organizations, and the complexity of supply chain networks are significant barriers that hinder the adoption of sustainable practices. Despite these challenges, the study also identifies several strategies and practices that can facilitate the adoption of green supply chain practices. Building strong supplier relationships, integrating sustainability into the core business strategy, and leveraging technological innovation are key approaches for overcoming the barriers to green supply chain adoption. The role of sustainability, entrepreneurship, emotional intelligence, marketing, and supplier relationship management are also highlighted as critical elements in promoting sustainable supply chains. The insights gained from this study provide valuable guidance for businesses and policymakers aiming to promote sustainability in supply chain management. By understanding the specific barriers faced by industry leaders and the strategies employed to navigate these obstacles, stakeholders can develop more effective policies and initiatives to support the transition to green supply chains. This research contributes to the broader literature on green supply chain management, offering a nuanced understanding of the challenges and opportunities associated with sustainable practices.

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