

ROLE OF SUSTAINABLE PRACTICES IN SUPPLY CHAIN MANAGEMENT FOR ACHIEVING CUSTOMER SATISFACTION IN E-COMMERCE



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Abstract

This paper explores the role of sustainable practices in supply chain management (SCM) and their impact on customer satisfaction within the e-commerce sector. As consumer demand for environmentally responsible and ethically produced products grows, businesses are increasingly incorporating sustainability into their supply chain strategies. The study explores various sustainable practices, including eco-friendly packaging, green logistics, ethical sourcing, and waste reduction, and assesses how these practices contribute to enhancing the overall customer experience. Additionally, the paper emphasizes the importance of transparency, carbon footprint reduction, and the adoption of circular economy models in e-commerce operations. Through an analysis of industry trends and real-world case studies, the research illustrates how sustainable practices influence consumer purchasing decisions, foster customer loyalty, and strengthen brand reputation. The findings demonstrate that integrating sustainability into supply chain management is essential for meeting the rising expectations of eco-conscious consumers and enhancing long-term customer satisfaction in the e-commerce industry.

Keywords: Sustainable Practices, Supply Chain Management, Customer Satisfaction, E-commerce

Introduction

Supply chain management (SCM) in e-commerce involves the strategic coordination of the flow of information, resources, and funds from suppliers to customers. It encompasses the entire supply chain, from sourcing raw materials to delivering finished products. SCM focuses on both internal resource allocation within the firm and the integration of resources with external partners within the same supply chain. This includes areas such as product development, procurement, manufacturing, logistics, customer service, performance measurement, integration, and information sharing. (Sarkar, 2023) Companies like Delhivery, Blue Dart, and Aaj Enterprises are also increasingly adopting sustainable practices in their operations.

In today's landscape, there is a growing emphasis on e-commerce sustainability, as green supply chain management gains popularity. Developed countries are grappling with sustainability issues while developing nations are beginning to implement sustainable

supply chain practices. (Nekmahmud, 2020) Sustainability refers to the ability to maintain or improve the state of something over time, particularly without depleting natural resources. In e-commerce, sustainability encompasses practices and strategies that reduce environmental, social, and economic impacts across various stages of the online shopping experience. Sustainable development focuses on three key areas: social, economic, and environmental sustainability.

Social sustainability emphasizes the well-being of individuals and communities, aiming to create a society where everyone feels valued, included, and supported. Economic sustainability involves creating systems that promote long-term prosperity while avoiding the depletion of resources or environmental harm. It aims to build a resilient, stable economy that benefits both present and future generations. Environmental sustainability is about protecting the natural environment to ensure that future generations can thrive. It focuses on meeting human needs while living

in harmony with the environment and minimizing harm.

Environmental sustainability is critical for maintaining the health of our planet, ensuring that it remains a safe and supportive home for all living beings. As the world faces challenges like climate change and environmental degradation, it is essential to address the environmental impact of e-commerce. The drive for economic growth and industrialization has depleted natural resources at an alarming rate, prompting businesses and governments to seek ways to balance consumer demands with sustainability.

E-commerce has become a dominant business model, allowing companies to sell products, information, and services through online channels that consumers can access anytime, anywhere. E-commerce businesses continuously refine their online platforms to offer more competitive products and services, which helps attract consumers. Over the past few decades, the growth of the internet and IT, coupled with increasing awareness, has significantly boosted e-commerce transactions.

The rise of smartphones and internet users has further accelerated this trend. (He, 2024).

India's e-commerce sector has revolutionized business practices, opening various segments such as B2B, B2C, C2C, and C2B. Leading e-commerce companies like Flipkart, Myntra, TataCLiQ, and Amazon India are actively pursuing sustainable supply chain practices. These companies are adopting eco-friendly practices such as reducing pollution, using sustainable packaging, promoting recycling, and raising customer awareness about environmental issues. Green marketing is also becoming a key focus, highlighting environmentally safe products. (Sharma, 2024)

As e-commerce continues to grow, it is more important than ever for businesses to prioritize sustainable development. By doing so, they can meet the needs of consumers, society, and the planet while maintaining economic stability. (Sharma, 2024)

Review of Literature

The research is based on a comprehensive review of past literature, including articles, journals, and online sources.

S.no.	Title	Author's Name & Year	Findings /Conclusions
1	"Multi-Objective Optimization for Economic and Environmental Sustainability in Apparel E-commerce Reverse Logistics"	Nikhil Sharma, Jeetesh Sharma, Arvind Keprate, Chirag Saraswat, Murari Lal Mittal 2024	This research highlighted the importance of striking a balance between economic factors and environmental sustainability in reverse logistics networks. In order to create a sustainable and economical system, trade-offs had to be made in order to determine the best configuration.
2	"Green E-commerce Supply Chain anagement"	Thanarak Prasertwit, Kanchana Kanchanasuntom, Varin Vongmanee 2024	The research highlighted the need for sustainable practices in the e-commerce sector to mitigate its environmental impact. The proposed green e-commerce model demonstrates the way to more sustainable commerce practices.
3	"Assessing the E-Commerce Sustainability Readiness: A Green Logistics Study on Online Sellers"	Yung-Tsan Jou, Cheng-Yi Lo, Klint Allen Mariñas, Charmine Sheena Saflor, Charles Jade Gutierrez, Cheryl Sanchez, Danica Songco, Jemer Redston, Mark Bryle Devara, Marr	This study indicated technology has a positive relationship in fostering sustainability. The results also establish significant positive correlations between sustainable e-commerce practices, government laws, seller behavior, and reverse logistics.

		Joseph Bucal 2024	
4	"Environmental Sustainability under E-Commerce: A Holistic Perspective"	Manas Sarkar 2023	The study highlighted the importance of green packaging and sustainable last-mile delivery in reducing environmental impact. It also emphasized the use of sustainable materials and ethical practices to demonstrate a company's commitment to environmental responsibility.
5	"E-commerce as a game changer for logistics in a sustainable context"	Arkadiusz Kawa 2023	This study indicated that Businesses must remain ahead of the curve as it becomes more important to adjust to changing trends and satisfy customers' demands, which place a greater emphasis on sustainability and ecologically friendly operations. Though its influence is gradually increasing, e-commerce has not yet completely transformed sustainable logistics.
6	"Sustainability and Consumer Behavior in Electronic Commerce"	Lenka Štofejová 2023	This study indicated Green marketing's digitization had a big impact on environmental attitude, which in turn drove both environmental purchasing behavior and future purchase intention. Other factors that influenced this attitude included subjective norms, an environmentally conscious lifestyle, willingness to pay for green products, and environmental purchasing behavior.
7	"Sustainable Logistics for E-Commerce: A Literature Review and Bibliometric Analysis"	Jose Alejandro Cano, Abraham Londono-Pineda, Caroline Rodas 2022	The study analyzed literature and performed a bibliometric analysis on sustainable logistics in e-commerce with a wider focus than previous last-mile-focused research, looking at economic, social, and environmental aspects through technology, collaboration, operations, and legislation.
8	"E-commerce acceptance in the dimension of sustainability"	Tining Haryanti, Apolpribadi subriadi 2022	This study emphasized the similarities between sustainability in e-commerce and the UTAUT (The Unified Theory of Acceptance and Use of Technology) model. Changes in the e-commerce phase affect variables like trust and habit formation. New topics like awareness and UX are crucial for e-commerce success as suggested in the study

9	"Green Logistics In E-Commerce"	Arkadiusz Kawa, Bartłomiej Pierański 2021	This paper indicated the customer values green logistics, boosting satisfaction and loyalty with eco-friendly actions that are essential to meeting expectations and making a positive impact.
10	"The e-commerce supply chain and environmental sustainability: An empirical investigation on the online retail sector"	Prakash Rao, Sreejith Balasubramanian, Nitin Vihari, Shazi Jabeen, Vinaya Shukla and any Chanchaichuji 2021	This study highlighted the results in models that in Model 1, consumers' environmental attitudes toward e-commerce were influenced by green consumerism, which in turn affected their behavioral intention. However, in Model 2, behavioral intention to use e-commerce channels was predicted by perceived usefulness and convenience of use, which were more significant than positive environmental views.
11	"Improving the e-commerce business model in a sustainable environment"	Mingwei Sun, Katarzyna Grondys, Nazim Hajiyeve, Pavel Zhukov 2021	The study indicated a connection between e-commerce success on social, environmental, and economic levels and the sustainability of business models. Companies also go closer to meeting the business sustainability standard when they increase their sustainability alignment.
12	"A Systematic Literature Review on Development Of Green Supply Chain Management"	Nekmahmud Md., Rahman S., Sobhani F. A., Olejniczak-Szuster K., FeketeFarkas M. 2020	This study highlighted that GSCM methods decreased manufacturing costs and emissions. Although these methods were still in their infancy in Bangladesh, industries like agriculture, leather, and textiles had started implementing them. A survey of the literature revealed several important issues, such as a lack of knowledge, infrastructure, technology, experience, and regulations.
13	"Devising e-commerce and green e-commerce sustainability"	Shaina Arora 2019	. This study focused on how eco-friendly packaging improves branding, greener retail environments benefit all stakeholders, and e-commerce encourages informed buying. Transparent communication and sustainable business practices increase customer loyalty, draw in new clients, and stimulate economic expansion.
14	"Evolution of Sustainability in supply chain management: literature review"	A Rajeev, Rupesh K Pati, Sidhartha S Padhi, Kannan Govindan 2017	This study revealed that covering all three dimensions of resilience is relatively rare, and further sectoral research is needed, especially on industries that are major polluters in developing countries. Furthermore, there is limited research focusing on social issues and assessing social impacts throughout the supply chain.

15	"Impact of supply chain management practices on sustainability"	K Govindan SG Azevedo H Carvalho V Cruz-Machado 2014	This study presented an innovative approach by simultaneously studying the three dimensions of sustainability (environmental, social, and economic) along with the lean, robust, and green supply chain management paradigms, which are considered strategic for improving supply chain competitiveness
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After reviewing existing literature, we identified that the key challenges in e-commerce are related to delivery, returns, and packaging. The question then arises how can we address these logistical challenges while also considering ecological concerns?

Objective

The objective of the study is to examine the role of sustainable practices in supply chain management in achieving customer satisfaction through e-commerce.

Research Methodology

This study is based on secondary data sourced from a wide range of materials, including scholarly research papers, journals, articles, and various online platforms.

Sustainable Practices in Supply Chain Management through E-Commerce

Sustainable supply chain management in e-commerce involves integrating environmentally and socially responsible practices throughout the entire online shopping process, from sourcing raw materials to product delivery and waste disposal. This approach is vital in reducing the environmental impact of a company's operations by minimizing waste, carbon emissions, and resource consumption. It includes using eco-friendly packaging, optimizing transportation routes, selecting sustainable materials, and ensuring ethical labor practices across all suppliers, all while maintaining business efficiency and customer satisfaction.

These practices include:

- **Green transport** – Green transportation lowers costs and dependency on fossil fuels by reducing emissions, improving air quality, and increasing energy efficiency. It promotes a cleaner economy, green jobs, and sustainable

mobility. Utilize fuel-efficient cars, plan your journeys wisely, and look at electric alternatives. (Sharma et al., 2024)

- **Reduce, Reuse, Recycle**– Adopt a circular strategy to minimize waste through resource efficiency, recycling, and material reuse. As highlighted by Nekmahmud et al. (2020), implementing green supply chain methods significantly reduces emissions and production costs by encouraging the reuse of materials and efficient resource management. This encourages a more sustainable and responsible use of resources by preserving raw materials, reducing landfill waste, and conserving energy.
- **Switch to Clean Energy and Sustainable Materials** – By selecting sustainable materials and utilizing renewable energy sources like solar or wind, businesses can lower their carbon footprint. Sarkar (2023) emphasizes the importance of using eco-friendly packaging and sustainable materials to reduce environmental impact and demonstrate corporate responsibility. Selecting recycled or biodegradable materials and collaborating with environmentally conscious vendors encourages conservation, reduces emissions, and builds a more sustainable, greener future.
- **Rethink Packaging**: Use biodegradable or reusable materials instead of single-use plastics. One of the biggest environmental problems is the use of single-use plastics. Sarkar (2023) highlights that adopting sustainable

packaging materials significantly reduces environmental harm and reflects a company's commitment to eco-friendly practices. Reducing plastic waste and its detrimental impact on ecosystems and wildlife can be achieved by switching to packaging made of recyclable, biodegradable, or compostable materials. Additionally, businesses can reduce waste by optimizing packaging to use fewer materials overall.

- **Measure Your Impact:** Track environmental performance and set achievable goals to improve over time. For ongoing improvement, monitoring environmental performance using indicators like carbon emissions, waste production, and resource use is essential. Sun et al. (2021) noted that aligning business models with measurable sustainability goals enhances overall performance and brings companies closer to sustainability standards. Businesses may make sure they are gradually lessening their environmental effect by establishing attainable sustainability targets.
- **Support Workers:** Ensure fair wages, safe conditions, and opportunities for growth. Providing safe working conditions, equitable pay, and chances for both professional and personal development all contribute to a productive workplace. Sun et al. (2021) emphasized that social sustainability—alongside environmental and economic performance—is essential for building resilient, ethical business models. Raising the standard of living for employees and their communities, supports social sustainability and is consistent with moral business practices.
- **Empower Communities:** Invest in local schools, healthcare, and infrastructure to create lasting positive

change. Making investments in nearby infrastructure, healthcare, and educational institutions not only raises the level of living in the neighborhood but also cultivates enduring goodwill among stakeholders. Sun et al. (2021), businesses that align with social sustainability principles—such as community development—are more likely to foster long-term positive impact and stakeholder trust. Businesses that prioritize the welfare of their communities can bring about long-lasting, constructive change and support social stability.

- **Stand for Equality:** Promote diversity and inclusivity at every stage of the supply chain. Encouraging inclusion and diversity in the workplace and supply chain guarantees that everyone, irrespective of gender, ethnicity, or origin, has equal opportunity. A dedication to diversity reflects social ideals, boosts employee morale, and encourages creativity (Sun et al., 2021).
- **Collaborate for Change** – Work with governments, non-profits, and local communities to tackle social challenges together. Working together is necessary to address complicated social and environmental issues. Businesses may pool resources, exchange information, and put into practice practical solutions to problems like poverty, healthcare, and education by collaborating with local communities, governments, and non-profits (Sun et al., 2021).
- **Diversify Suppliers** – Work with multiple partners to reduce the risk of disruptions. Businesses that depend on a single source of essential materials or goods may be more susceptible to interruptions (such as supply chain problems or natural catastrophes). By diversifying their suppliers, businesses lower risks and increase sourcing stability, which eventually helps their

operations and clients (Kawa & Pierański, 2021).

- **Plan for the Unexpected** – Use data and forecasting tools to prepare for economic changes and demand shifts. Business operations may be disrupted by market trends, economic developments, or unforeseen circumstances (such as pandemics). By utilizing data, forecasting tools, and risk management techniques, businesses can better plan for these changes and make timely adjustments to reduce adverse effects (Cano et al., 2022).
- **Invest Smartly** – Adopt affordable technologies that improve efficiency without breaking the bank. While implementing new technology to increase productivity is crucial, companies should make sure that these expenditures are economical and yield long-term benefits. By concentrating on scalable, reasonably priced technologies, businesses can enhance their operations without putting a significant strain on their financial resources (Štofejová, 2023).
- **Find the Right Balance** – Optimize inventory management to meet demand without overstocking. Sustainability depends on keeping inventory management in check. Whereas underproduction may cause shortages, overproduction results in waste. Businesses can minimize waste and maximize resources by meeting demand without overstocking by utilizing predictive analytics and astute inventory management techniques (Rao et al., 2021).
- **Focus on Relationships** – Build strong partnerships with suppliers and customers to navigate challenges together. Developing solid bonds with clients and suppliers contributes to the development of a robust, win-win business environment. Navigating

obstacles, preserving stability in the face of changes, and promoting long-term success all depend on solid partnerships (Prasertwit et al., 2024).

- **Adapt Quickly** – Stay flexible and open to change as new economic conditions emerge. Change is a constant in the corporate world, and long-term success requires flexibility. In the face of changing consumer preferences, regulatory changes, or new economic situations, organizations can remain flexible by remaining receptive to new concepts, procedures, and technology (Haryanti & Subriadi, 2022).

Other important factors

- **Green Marketing** – Sustainability in marketing is about promoting products with brands that prioritize the environment. It helps build trust and deeper connections with customers. Green marketing includes the promotion of eco-friendly products, as well as techniques for eco-conscious marketing (Arora, 2019). This marketing strategy not only boosts brand loyalty but also encourages consumers to make environmentally responsible purchasing decisions.
- **Warehouse** – Businesses can have warehouses where all the inventory is stored near the office, facilitating easy communication and delivery of information and goods with less wastage of resources. In the warehouse, using clean and renewable energy is essential to reduce the environmental impact (Sarkar, 2023). This also supports overall sustainability goals by reducing energy consumption and promoting eco-friendly operations.
- **Digital Payment System and E-Marketplace Platform** – In e-commerce, goods and services are bought and sold online through applications, such as Flipkart, Amazon, and Swiggy. Digital payment systems

are essential for e-commerce as they replace cash payments, which are less environmentally friendly (Štofejšová, 2023). Using digital transactions helps streamline the process, reduce waste, and increase convenience for both businesses and consumers.

- **Be Transparent**-Share where products come from and how they are made so customers can make informed choices. Being open and honest with stakeholders, including consumers and staff, fosters trust. Businesses help consumers make educated decisions about the social and environmental effects of their purchases by being transparent about the origins of their products and the manufacturing process (Prasertwit et al., 2024). This transparency strengthens relationships and ensures ethical practices in business

Customer Service – Customer service is the support provided by the business to customers before, during, and after purchase. It involves making people feel valued, heard, and satisfied with the experience while asking about any issues, questions, feedback, or guidance. Sustainable customer service involves reducing paper usage, better communication, providing eco-friendly solutions, sustainable packaging, and offering improved services (Rao et al., 2021). This approach helps reduce the environmental footprint and enhances customer satisfaction.

There are various e-commerce companies in India adopting sustainable practices in their supply chain. A few examples are Flipkart, Myntra TataCLiQ, etc.

Table -2 Here is a case study of Flipkart

Month & year	Achievement	Details
August 2019	Plastic recycling commitment	Committed to recycling 100% of the plastic used at its warehouses
January 2021	ISO22301 Certification	Received business continuity certification from the British Standards Institute (BSI) for 26 key sites.
February 2021	EV Adoption partnership	Partnered with Hero Electric, Mahindra Electric, and Piaggio to scale up electric vehicles in the logistics fleet.
July 2021	Sustainability Partnership	Partnered with Canopy for responsible sourcing of sustainable packaging and cellulosic fibers.
September 2021	EV Deployment milestone	Deployed 2000+ electric vehicles under the EV100 initiative ahead of target.
September 2021	Sustainable packaging adoption	Over 75% of seller partners adopted sustainable packaging.
February 2022	EV Electrification on report	A report by WBCSD recognized Flipkart as a trendsetter in e-commerce and e-delivery fleet electrification.
January 2023	Launch of Flipkart Green	Introduced an e-store for sustainable products.
August 2023	Sustainability Promotion	Partnered with Walmart Foundation to promote crop residue management and eco-consciousness.
November 2023	Waste diversion	Diverted approximately 3,000 tonnes of waste from landfills in one year.
March 2024	Water conservation milestone	Recycled over 67 million liters of wastewater in one year.

Source: <https://corporate.flipkart.net/sustainability>

By providing eco-friendly packaging, cleaner deliveries via electric cars, and access to sustainable products through Flipkart Green, Flipkart's sustainability initiatives improve the user experience. These initiatives foster a healthier atmosphere, encourage thoughtful shopping, and increase trust. Stable pricing and dependable service may also be maintained with the aid of operational efficiencies. All things considered, consumers gain from a more ethical and environmentally friendly shopping platform.

Sustainability & Its Impact on Consumer Satisfaction

Customer satisfaction is increasingly shaped by how consumers feel about their purchases. Today's consumers not only seek high-quality products but also want their buying choices to align with their values. Companies that adopt eco-friendly practices foster stronger customer loyalty, trust, and deeper relationships. Sustainability enhances customer satisfaction, as consumers are more likely to support businesses that prioritize social and environmental issues. Trust, which is highly valued by consumers, is strengthened when companies are transparent about their environmental efforts. Additionally, consumers perceive sustainable products as more innovative, durable, and of higher quality, adding value to their purchase and making them feel positive about their choices. Moreover, the importance of green logistics becomes more pronounced when considering customer happiness and loyalty in Online Retail.

Future Scope of the Study

Today's consumers seek more than just quality products—they want to feel good about their purchases. They are increasingly concerned with the origins of the items they buy, the methods used to make them, and the broader impact their choices have on the planet. This shift in consumer values is pushing businesses to reassess their supply chains and adopt sustainability not merely as a trend, but as a fundamental principle.

- **Knowledge about the Product** - People want transparency. They are asking questions like, “Where did this come from? Who made it? Was it made responsibly?” For businesses, this means opening the doors and showing exactly how their products are created. It is about earning trust through honesty and clarity.
- **Eco-Friendly Choices**-Shoppers are looking for products that do not harm the planet. They want items made with sustainable materials, less packaging, and a smaller carbon footprint. The challenge for businesses is to make these eco-friendly choices without driving up costs too much.
- **Fairness and Respect for Workers**- Consumers care about the people behind the products. They don't want to support brands tied to unsafe factories, unfair wages, or exploitation. Companies need to ensure their supply chains treat workers with dignity and provide safe, fair conditions.
- **Sustainability that is Affordable**- Sustainability should not feel like a luxury. While many customers want to make eco-friendly choices, not everyone can afford higher prices. Businesses must find ways to make sustainability accessible for all without compromising their values.
- **Action Over Words** - Words are not enough anymore. People are tired of empty promises or vague claims about being “green.” They want to see real action—things like certifications, measurable results, and clear progress on sustainability goals.
- **A Personal Connection**- Consumers want to feel like their purchases align with their values. They are drawn to brands that share stories about their sustainability efforts—stories that show real commitment and make them feel part of something bigger.

Meeting consumer expectations goes beyond driving sales; it's about building trust, fostering loyalty, and contributing to a healthier, more equitable world. When businesses embrace sustainability and engage their customers in the journey, they create something meaningful—products with purpose and a brighter future for all.

As technology continues to evolve, new innovations are enhancing e-commerce platforms to provide a better online shopping experience. Digital advancements in payment systems, billing, trading, grievance resolution, and the promotion of green products and packaging all play a significant role in boosting consumer satisfaction and loyalty.

RECOMMENDATIONS

Governments may significantly contribute to the development of sustainable supply chains by enforcing labor and environmental laws, providing financial incentives for environmentally friendly practices, and establishing climate targets like net-zero emissions. They promote circular economy efforts to cut waste and promote transparency by requiring impact disclosures. Governments contribute to the development of more equitable, sustainable, and resilient global supply networks by encouraging innovation and international collaboration.

The government can also support a sustainable e-commerce supply chain through policies for

- Tax incentives for green practices
- Subsidies and grants for adopting green technologies
- Encourage or mandatory the use of verified eco-labels and certificates (e.g., Energy Star)
- Invest in digitalization and logistic infrastructure
- The government should promote sustainable consumption through campaigns to create public awareness

Making ethical decisions that benefit the environment, people, and future generations is the first step in building a sustainable supply chain. But it has a number of problems in the

social, economic, and environmental spheres. Pollution, waste, resource depletion, and excessive energy consumption are examples of environmental problems that negatively impact ecosystems and biodiversity. Social issues such as gender inequity, child labor, and worker exploitation necessitate ethical labor practices. Businesses face financial difficulties due to growing costs, unforeseen disruptions, technology investments, and logistics expenditures. Innovation, openness, and cooperation are necessary to strike a balance between sustainability and profit. Although overcoming these obstacles is difficult, doing so is necessary for long-term success. A sustainable supply chain is a continuous process rather than a fin

Businesses can overcome these challenges by –

- Conducting regular audits
- Partner with environmentally conscious suppliers
- Adopt governmental policies made for a sustainable supply chain
- Invest in green technology
- Provide training to employees on the sustainable goal of the business
- Adopt a circular economy model (reuse, recycle, repair)

Conclusion

E-commerce is growing rapidly, and businesses are increasingly adopting sustainable practices across various aspects of their supply chain management. Today, companies are incorporating sustainability into logistics, packaging, payment systems, raw materials, and even the production process and products themselves. This shift creates awareness among customers, boosting their satisfaction and loyalty. Consumers are now more inclined to prefer green products, sustainable production methods, eco-friendly logistics, and environmentally conscious packaging.

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