Sustainability Across Retail:

From Operations to Experience

DN
Diebold Nixdorf
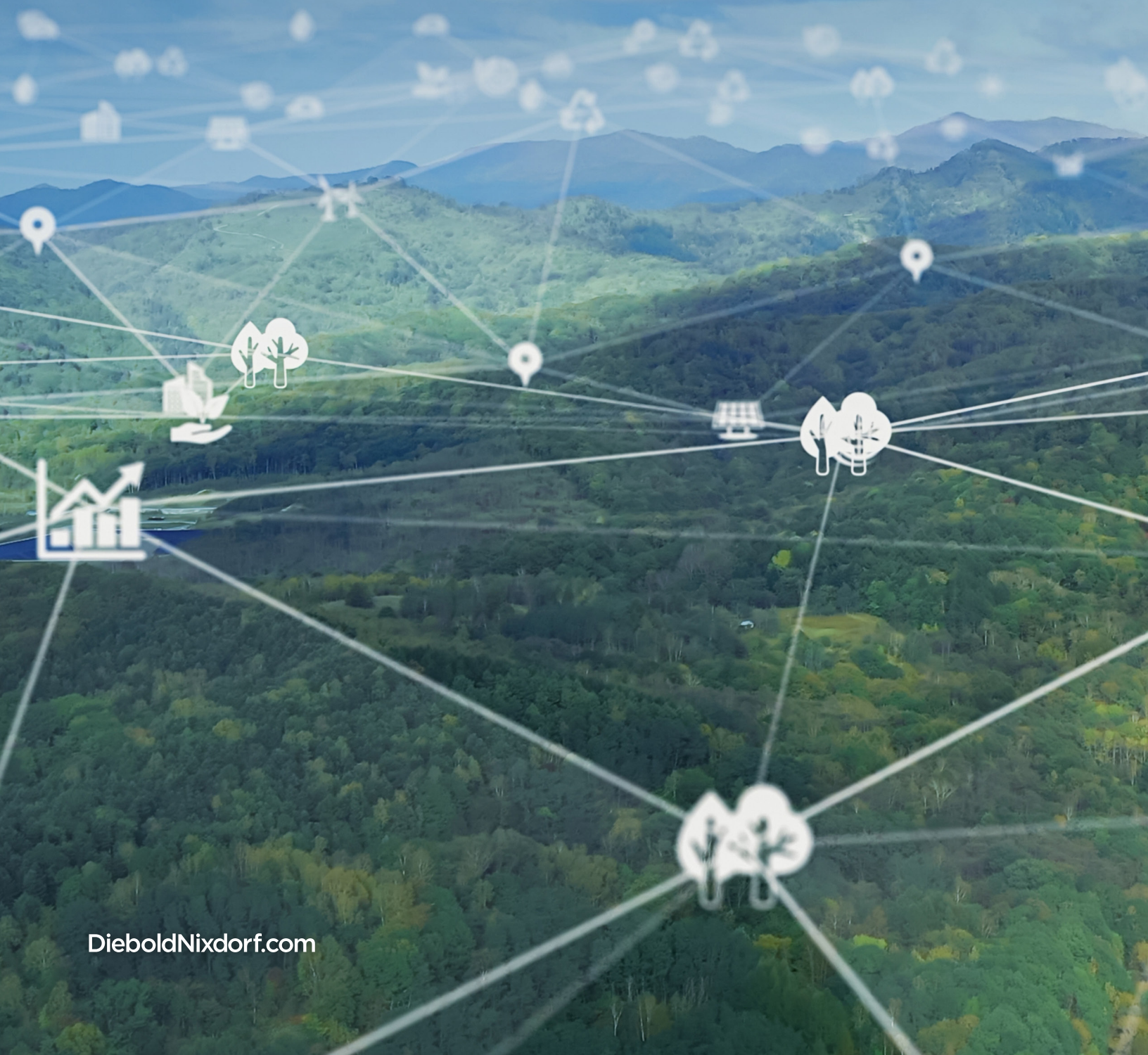
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Introduction

Sustainability is no longer an optional strategy for retailers; it has become a business imperative. Driven by increasing consumer demand and rigorous regulatory standards, sustainable practices are reshaping the retail landscape.

As a result, the retail industry must adapt to meet the expectations of consumers, such as the rising Gen Z, who prioritize brands demonstrating environmental and social responsibility and are projected to become the wealthiest generation by 2030, with a global spending power growth of $12 trillion (NielsenIQ).

**According to Capital One Shopping data:**

63%

of Gen Z shoppers prefer products that display their environmental impact, and they are 53.1% more likely to choose products based on sustainability rather than brand names.
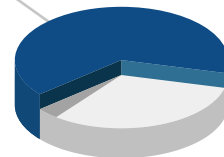
20.1%

of Boomers feel similarly, illustrating generational differences in sustainability priorities and the incoming demand for sustainable practices.
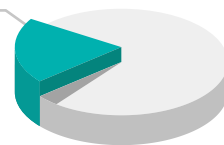
Regulatory pressures are also mounting, with extensive legislation emerging across the globe, including the EU Green Deal, the California Transparency Act, and the Paris Climate Accords. The EU's Corporate Sustainability Reporting Directive (CSRD), set to impact over 50,000 companies by 2026, mandates extensive reporting requirements for businesses operating in the EU. Design standards like the Ecodesign for Sustainable Products Regulation (ESPR) are also pushing companies toward more sustainable product practices. The 2024 Global Plastics Treaty and the impending U.S. SEC Climate Disclosure Rule reflect a broader commitment to environmental accountability, requiring businesses to rethink their operations and supply chains.

When implemented strategically, sustainability not only complies with these regulations but also offers a competitive advantage. Retailers embracing eco-friendly technologies and transparent practices are better positioned to attract and retain environmentally conscious shoppers, enhance customer loyalty, and reduce operational costs.

Sustainability Throughout Retail

Sustainability's impact across the retail ecosystem has been nothing short of transformative; from strategic business models and operational efficiencies to the evolving consumer experience, sustainability influences every touchpoint—including product sourcing and supply chains, waste reduction, energy-efficient store operations, sustainable shopping behaviors, last-mile delivery, food waste management, and recycling initiatives.

Each of these areas plays a critical role in reducing environmental impact while shaping a more responsible and future-focused retail industry. These initiatives not only fulfill regulatory and ethical obligations but also create opportunities for growth, innovation, and deeper engagement with all stakeholders involved in the retail landscape.

As global companies increasingly prioritize Environmental, Social, and Governance (ESG) factors, the retail sector serves as a key example of how these principles drive meaningful change. ESG integration enhances long-term resilience, supports compliance with international regulations, and strengthens brand loyalty by aligning with consumer values. Moreover, investors and partners now evaluate ESG performance as a critical metric, emphasizing its role in mitigating risks and unlocking new market opportunities. By embedding sustainability into their operations, global retailers can not only reduce their environmental impact but also build trust and foster innovation across their supply chains and consumer touchpoints.

**Environmental**   **Social**   **Governance**
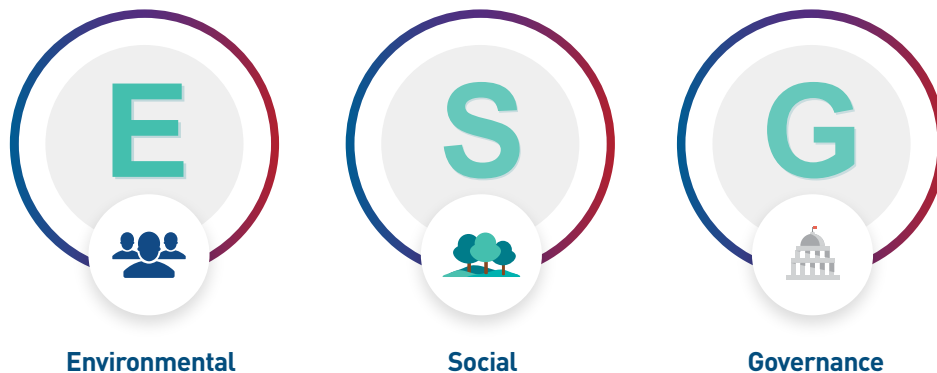
For the Brand

Sustainability in retail goes beyond meeting regulatory requirements; it drives tangible business benefits, including cost savings, risk mitigation, and long-term growth, while also enhancing brand identity, optimizing operations, improving customer experience, and fostering innovation. By integrating eco-friendly sourcing, waste reduction, energy efficiency, and ethical practices, retailers not only reduce their environmental impact but also strengthen their brand, customer loyalty and competitive advantage.

In an era where the global energy demand is set to skyrocket—particularly as Artificial Intelligence and data-driven technologies increase the need for energy-intensive data centers—retailers must adopt more efficient practices. Goldman Sachs Research projects a 160% rise in global data center power demand by 2030, with carbon emissions potentially doubling within the same period, underscoring the urgent need for sustainable energy solutions. To address these challenges, proactive investments in renewable energy and resource-efficient operations are essential.

Data Center Power Demand
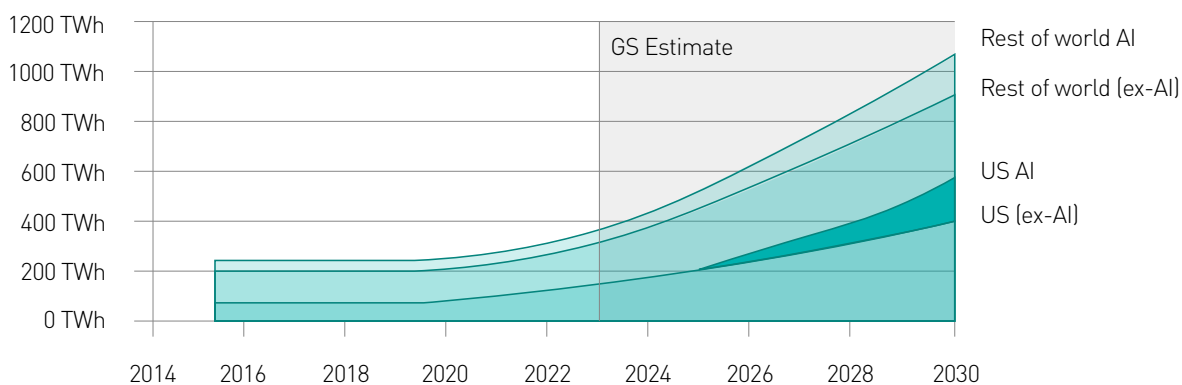
Source: Masanet et al. (2020), Cisco, IEA, Goldman Sachs Research

There is even a financial upside to these investments, according to research by Diebold Nixdorf, which found that a 20% reduction in energy costs can be as impactful as a 5% increase in sales. Technologies that support this reduction, such as energy-efficient self-service kiosks and integration with store infrastructure such as LED lights and power management systems, not only drive cost savings but also align with broader sustainability goals. By offering these services, as well as predictive analytics, energy management tools, and a modular design to reduce hardware waste, Diebold Nixdorf helps retailers optimize resource use, make informed decisions that minimize environmental impact, promote energy efficiency, and remain environmentally conscious.

However, implementing these sustainability initiatives comes with challenges. High upfront costs, complex supply chains, and rapidly evolving technologies require a strategic approach. Retailers must balance short-term investments with long-term gains, ensuring their sustainability efforts align with consumer and employee expectations. This alignment is crucial, as today's workforce increasingly values corporate responsibility, and consumers are quick to support or boycott brands based on their environmental practices.

For the Store

Physical store environments offer a rich opportunity for implementing impactful sustainability measures. Despite the rise of e-commerce, roughly 80% of retail sales still occur in brick-and-mortar stores, underscoring the importance of integrating eco-friendly technologies at these locations.

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Store design often is overlooked in sustainability initiatives or focuses solely on energy efficiency. Waste reduction strategies, such as comprehensive recycling programs, composting initiatives, and zero-waste goals, go a long way to minimizing environmental impact, while innovative store layouts prioritizing recycled and eco-friendly materials are becoming more prevalent, signaling a deep commitment to environmental stewardship. To effectively make and reach these goals, however, retailers must take steps to track key metrics, including energy consumption, the carbon footprint of individual stores, pounds of recycling collected in store initiatives, and more. Leveraging technology and automation is an effective way to minimize energy consumption and maintain monitoring of some of these metrics. Taking steps to implement sustainability measures within stores can be as simple as encouraging or mandating reusable bags or as complex as infrastructure updates such as energy-efficient POS solutions, digital shelf labels, smart lighting, and Advanced Energy Management Systems (EMS) for HVAC systems.

To promote eco-friendly in-store practices, many retailers are introducing initiatives like reusable bag incentives and stringent plastic reduction policies. By fostering a sustainable culture, stores not only reduce waste but also engage customers in meaningful ways and garner professional accolades, such as obtaining a CDP compliance grade, highlighting a commitment to sustainability.

Additionally, digital receipt options reduce paper waste, promoting an eco-friendlier shopping experience. By eliminating the need for printed receipts, retailers significantly cut down on paper consumption, addressing environmental concerns and creating a more sustainable shopping experience. Beyond the environmental impact, digital receipts streamline recordkeeping for consumers, eliminating the hassle of managing physical receipts and reducing clutter. For retailers, these receipts serve as a powerful loyalty driver, enabling targeted promotions and personalized offers directly tied to purchase data. Solutions like Vynamic Digital Receipts not only help stores align with sustainability goals but also create opportunities for deeper customer connections and improved shopping experiences.

Full-Scale Digital Ecosystems

Self-Service Checkout System

Ensure automatic updates based on the supply chain, and central management of eco-reward loyalty programs

Electronic Shelf Labels

Point-Of-Sale System — Powered by — **12th Gen Alder Lake PS Processors** — Offer

- Energy efficiency
- Up to 58% less power consumption compared to previous models
- 2x Processing speed

Energy-efficient POS solutions, including standard tills and self-checkouts, play a crucial role in improving sustainability by reducing overall electricity consumption in retail stores. Modern tills with low-power components and efficient cooling systems help minimize energy waste during transactions, while self-checkout kiosks with smart standby modes further lower power usage when idle. Diebold Nixdorf modular point-of-sale systems, powered by 12th Gen Alder Lake PS processors, offer exceptional energy efficiency, consuming up to 58% less power compared to previous models while delivering double the processing speed. These full-picture technologies not only streamline shopping experiences, reducing wait times, and minimizing energy consumption in the process, but also allow retailers to remain constantly up to date on efforts to meet environmental goals.

AI-driven self-checkouts optimize store operations, allowing for fewer staffed registers and less unnecessary energy consumption. By streamlining transactions and improving efficiency, these systems not only enhance customer convenience but also contribute to a lower carbon footprint. When integrated with renewable energy sources, energy-efficient POS solutions create a more sustainable and responsible retail environment. Diebold Nixdorf's Vynamic AI platform is at the forefront of this transformation: capable of identifying unbarcoded items, streamlining the checkout process while reducing environmental impact and highlighting the growing importance of digital ecosystems in retail sustainability.

Energy-efficient technologies, such as LED lighting and digital shelf labels, are modernizing store operations. LED lighting, for instance, can reduce energy consumption by 75%, while automated lighting controls like occupancy sensors optimize energy use in less trafficked areas. Digital or electronic shelf labels further enhance efficiency, consuming power only when updating content, making them an ideal solution for retailers looking to cut energy use and save on operational expenses.

EMS can monitor and optimize energy use across multiple locations, providing predictive maintenance alerts for HVAC systems to reduce waste, enhancing both sustainability and operational efficiency and allowing retailers to maintain optimal performance while cutting costs.

Another powerful enabler of sustainable retail operations is the shift toward proactive, predictive, and preventative service models—driven by intelligent remote monitoring and smart data correlation. These advanced capabilities significantly reduce the need for in-person technician visits, directly lowering fuel consumption, travel-related emissions, and service-related carbon footprints. By identifying potential system issues before they escalate, this data-driven approach extends the lifecycle of retail IT equipment, reducing the frequency of repairs or replacements and minimizing e-waste. Remote diagnostics also ensure optimal device performance and energy efficiency by detecting anomalies such as excessive energy use or unnecessary device operation. This not only helps reduce energy consumption across store networks but also enhances business resilience by preventing system downtime. As retailers scale, these intelligent services grow with them—without the need for proportional increases in physical maintenance—empowering sustainable growth with minimal environmental strain. For retailers, this means aligning cost-saving operational efficiencies with ambitious sustainability goals, while offering consumers a consistently seamless experience.

In conclusion, the integration of energy-efficient POS solutions, digital shelf labels, smart lighting, EMS, and sustainable managed services significantly contributes to a more sustainable retail environment. By reducing energy consumption, minimizing waste, and optimizing processes, these solutions not only lower the carbon footprint of retail operations but also promote responsible resource use. Embracing these technologies and practices helps retailers align with the growing demand for eco-conscious shopping experiences, ensuring long-term sustainability for both businesses and the planet.

For the Consumer

Modern, environmentally conscious shoppers increasingly seek brands that align with their values, making ethical product sourcing and transparent supply chains essential rather than optional.

In a global grocery survey by Nielsen, <u>64% of respondents identified as environmentally conscious</u>, reinforcing the importance of clear sustainability credentials.

Brands like H&M, which aims to use 100% recycled materials by <u>2030</u>, and Beyond Meat, which leads the global transition to plant-based proteins, have recognized this shift and integrated sustainability into their business models. H&M has made significant strides in fabric recycling technology, while Beyond Meat focuses on providing nutritious, sustainable plant-based protein options that are better <u>for people and the planet</u>.

Retailers who can offer clear, verifiable information on their products' environmental impact stand out, cultivating deeper trust and loyalty. This is especially true for younger, urban shoppers with higher incomes, primarily Gen Z and millennials, who expect brands to take meaningful steps toward environmental protection. In a global grocery survey by Nielsen, <u>64% of respondents identified as environmentally conscious</u>, reinforcing the importance of clear sustainability credentials.

These consumers are not only aware of environmental issues; they actively seek eco-friendly options, from biodegradable packaging and refillable containers to sustainably sourced materials. Retailers can further enhance the appeal of these offerings by educating their customers. In-store displays and digital campaigns that articulate the environmental benefits of specific products empower shoppers to make informed decisions. For example, Diebold Nixdorf's self-service solutions can deliver educational content right at the point of sale, highlighting the advantages of using reusable bags over single-use plastics.

With over 66% of global consumers willing to pay more for products from brands that demonstrate a genuine commitment to environmental and social responsibility, a clear sustainability strategy is not simply good for the planet, it is essential for building lasting consumer relationships.

Consumer engagement is further enhanced using reward-based sustainability programs. Loyalty programs that incentivize sustainable behaviors, such as discounts for using reusable bags or participating in recycling initiatives, are increasingly popular. By incorporating these programs into their operations, retailers can encourage consumers to adopt eco-friendly practices while reinforcing a positive brand image. Consumer engagement and loyalty solutions, as Vynamic Engage from Diebold Nixdorf, enable seamless implementation of these initiatives, making it easier for consumers to participate. Additionally, social responsibility plays a crucial role in shaping consumer perceptions. Shoppers are increasingly drawn to brands that prioritize broader societal issues, such as carbon footprint reduction and fair labor practices. This shift in consumer values has a direct impact on brand advocacy and loyalty.

Conclusion:

Sustainability has become a central theme in how brands differentiate themselves. The intersection of consumer demand and technology-driven solutions presents a unique opportunity for retailers to lead by example, using solutions such as those from Diebold Nixdorf to create a more meaningful, transparent, and environmentally friendly shopping experience, utilizing modular designed check-out infrastructures that reduce waste, integration of eco-reward-based loyalty systems, and more to make a long-term difference on environmental goals. Companies that authentically embrace and communicate their sustainability efforts are more likely to retain and grow their customer base, as their commitment resonates with the values of a new generation of eco-aware consumers.

About Diebold Nixdorf

Diebold Nixdorf is a global leader in connected commerce solutions, dedicated to advancing sustainability across the retail ecosystem. The company has long embedded environmental stewardship into its operations, demonstrating that cost efficiency and sustainable growth are not only compatible but mutually reinforcing. Through its Storevolution™ program, Diebold Nixdorf equips retailers with flexible, digitized, and customer-centric solutions that drive down energy consumption and operational costs, while enhancing the shopping experience.

Diebold Nixdorf's sustainable technologies, such as energy-efficient self-service kiosks, modular POS systems, and innovative software solutions are designed with a comprehensive approach to resource conservation. The DN Series® BEETLE platform, for example, features a modular design that extends product lifecycles, reduces electronic waste, and ensures seamless upgradability — allowing retailers to adapt to evolving needs without replacing entire systems. Additionally, the incorporation of Intel's highly energy-efficient processors and intelligent power management features supports significant reductions in energy use, contributing to a lower total cost of ownership (TCO).

The company's commitment also extends to its innovative serviceability solutions, leveraging remote monitoring and predictive analytics to resolve issues without requiring on-site intervention. This approach not only saves time but also reduces the environmental impact of service calls by reducing travel. By proactively maintaining systems and designing check-out solutions with recyclability in mind, Diebold Nixdorf helps retailers decrease waste, streamline operations, and decrease their carbon footprint. These advancements underscore the company's mission to empower its clients to operate more sustainably, foster consumer loyalty, and align with global efforts to protect the environment. Through ongoing innovation and partnerships, Diebold Nixdorf remains at the forefront of delivering eco-conscious solutions that make a measurable impact, reflecting its deep-rooted commitment to environmental and social responsibility.

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