How Green Digitalization Helps Retailers

Grow Sustainably and Responsibly

Hanshow

What is Green Digitalization? Why is it a Must for Retailers?

Traditional retailers must now adapt to the changing landscape and prioritize both digitalization and sustainability in their operations to stay relevant. By doing so, they can enhance their competitiveness, meet customer expectations, address labor challenges, and navigate economic uncertainties. We call this positive synergy in the retail space **Green Digitalization**.

Many of the latest technologies are already environmentally friendly or are quickly becoming so through the applications and efforts initiated by the technology firms that develop them. This process is driving a greener and more sustainable operating model in the retail industry by end users that apply them. With a sustainability mindset and new digital tools, traditional retailers can now not only improve efficiency, customer experience, and profitability, but also reduce energy use and carbon emissions, minimize waste, foster inclusivity, and better support local communities and economies. In short, digitalization can be **GREEN**.

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While this endeavor presents formidable challenges, it offers equally significant opportunities. The imperative to take quick, decisive action is now clearer than ever. Most importantly, stakeholders in the retail ecosystem – retailers, consumers, technology companies, governments, and non-governmental organizations – need to join hands and continue to drive technological, business, and social innovation and integration to further aid the retail industry's Green Digitalization and a sustainable future.

Digital technologies like mobile payments, big data, cloud computing, AI, and IoT are reshaping retail. Traditional retail faces challenges from e-commerce, changing customer behavior, and supply chain complexities, accelerated by the COVID-19 pandemic.

Retailers must prioritize digitalization to improve efficiency and profitability, as margins have declined 2-3% annually. As digital leaders achieve 5% yearly sales growth, failure to adapt to tech challenges is a long-term risk.

Responding to environmental sustainability and CSR concerns is also essential for retail's long-term growth. Neglecting these issues risks customer loss, fines, and reputational damage due to increased demands from various stakeholders, such as the European Union's GHG reduction target and Gen Z's preference for sustainability over brand.

Retail's Dual Growth Engine –Green Digitalization

A retailer's primary sphere of influence is over directly controlled stores, both online and offline, where Scope One and Scope Two carbon emissions[1] occur. Consequently, the discourse on **Green Digitalization** is initiated within this context. Operating a retail establishment, particularly in the grocery sector, has historically posed formidable challenges. In the contemporary business landscape, these challenges have only intensified. Questions arise regarding the feasibility of meeting the highly personalized preferences of countless customers across various shopping channels, managing tens of thousands of stock-keeping units (many of which are perishable) without compromising quality or incurring excessive waste, and striking the delicate balance between setting prices that align with customer expectations while preserving profit margins.

In this complex environment, Green Digitalization emerges as a transformative ally. Specific solutions, working in synergy, can enhance the intelligence and sustainability of retail establishments, thereby offering resolutions to these multifaceted challenges.

Components of a Faster, Smarter and Greener Retail Value Chain	Agile, Adaptive & Sustainable Supply Chains	Smarter & Greener Omni-channel Stores	Responsible & Sustainable Consumption
Key Stakeholders	Suppliers & Partners	Retailers	Consumers
Carbon Impact (GHE Scope 1, 2, 3)	Scope 3	Scope 1 & 2	Scope 3

Example Green Digitalization Tools & Solutions	• Digital Supply Chain Solution (Microsoft Dynamic 365)
	  • AI, machine learning
	  • Cloud-based server
	  • RFID, Blockchain
	  • Robotics
	  • IoT
		• Digital Commerce Solution (Microsoft Dynamic 365)
		• Green Store Solution (Hanshow, Eink, Microsoft, Intel)
		  • Electronic Shelf Label (ESL)
		  • ESL-based Precise Article Localization
		  • Smart Shelf Management
		  • Self-checkout Kiosk & Smart Trolley
		  • Centralized, Cloud-Based SaaS Platform
		• Solar Power Solution (Hanshow)
			• Digital CRM
			• Digital communication
			• AR, VR experience
			• Digital tracking (QR code)
			• Online community
			• Virtual events

Creating Smarter and Greener Stores

The nature of retailing (especially food retailing) requires stores to make frequent price changes to many SKUs and to do so accurately and quickly; the demand is increasing given the velocity of change in today's marketplace. The traditional manual update is time-consuming and prone to errors, delays, and inconsistencies between different systems (i.e., between shelf label and cashier), which can cause serious consequences such as missed sales opportunities, lost margins, and customer complaints, but more broadly generates more waste and inefficiencies. Developed with like-minded industry partners, Hanshow's Electronic Shelf Label (ESL) and Smart Shelf Management solutions can meet these and future challenges.

1 Hanshow, Intel, and Microsoft Launch Smart Shelf Management for OSA

On-shelf availability (OSA) has always been a top priority for retailers, especially grocers. Traditionally, grocers manage store OSA by manual observation, inspection, and replenishment at a pre-defined frequency. There are many issues with this approach: high labor cost, unintended errors, and untimely response to out-of-stock (OOS) items, often resulting in significant lost sales and unhappy customers. A study by the IHL Group found that the OOS rate in the retail industry was as high as 8%, accounting for 4.1% of lost revenue for an average retailer[2]. After deploying Hanshow Smart Shelf Management, the product's OOS duration for a European retailer dropped by 40%, from 2.5 hours to 1.5 hours, significantly improving product OSA. Powered by Microsoft AI and Intel® Core™ processors, the Hanshow Smart Shelf Management solution is capable of automatically determining OOS items, incorrect item placements, and other shelving issues, so retailers are promptly alerted of any abnormality and can take appropriate action. This is done through identification, classification, and stock-taking of shelf items with the use of Hanshow Visight, Hanshow SPatrol robot, and various algorithm applications. With this powerful solution, retailers can greatly improve store OSA and better meet customers' shopping needs.

After deploying Hanshow Smart Shelf Management, the product's OOS duration for a European retailer dropped by **40%**, from **2.5** hours to **1.5** hours, significantly improving product OSA.

2 Hanshow's ESL Solution Reduces Paper Waste

Hanshow's ESL solution allows price and other product related data, such as texts and images, to be presented digitally by using ePaper technology from E-Ink – a pioneer in the field – instead of being printed on paper. It can also serve as a building block IoT device for interaction with an expanded retail digitalization network. This solution replaces traditional paper price labels and realizes integrated management of a massive number of ESLs with synchronous price changes, positioning lights, and other functions through its All-Star platform for more accurate, efficient, and sustainable operations.

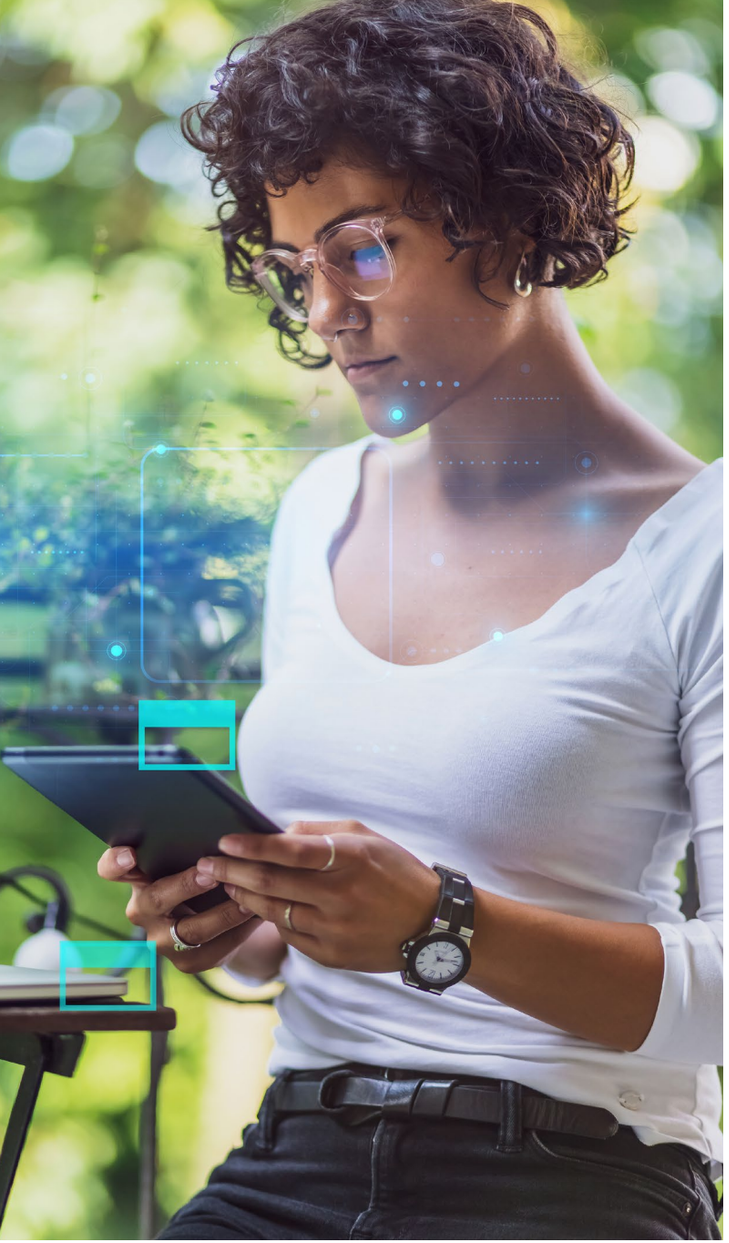
To maximize the sustainability of its technology, Hanshow is committed to developing long-lasting ESL products, such as its Nebular ESL, which is specially designed with a battery life of up to 15 years (based on update usage of twice per day). According to E-Ink estimates, if 30 million 10" ESLs are installed in the market and each ESL display is updated four times a day, about 30 million pieces of paper can be saved over five years, meaning that about 15.2 million trees are spared from felling and about 8.37 million tons of carbon emissions are avoided. [3]

3 Guiding Principles for Green Digitalization

- Adopt an ecosystem view. Embed sustainability consideration in business decisions throughout the entire value chain.
- Take an integrated approach and make sure that all technologies and solutions work in tandem to achieve optimal results.
- Make sure to evolve operating models and business processes with technology deployments to harness the most value.
- Understand the organizational and social impact of digitalization.
- Enforce vigilant governance on data protection and customer privacy. Ensure compliance with regulations and best practices.
- Monitor the impact in the design, manufacturing, application, and deployment of the technological solutions themselves.

Emerging Technologies Accelerate the Retail Industry's Green Digitalization

The retail industry is evolving to meet changing consumer needs and market dynamics. In recent years, emerging technologies have been disrupting the retail landscape, reshaping the way businesses operate and interact with customers. AI, VR, robotics, and IoT are opening exciting opportunities for retailers to enhance their operations, improve customer experience, and drive sustainable growth.



1 Artificial Intelligence (AI) and Machine Learning

New generative AI (AI-Generated Content, AIGC), is a powerful type of AI that can create new and original content by learning patterns in data, using complex algorithms and methods of learning inspired by the human brain, adding even more brain power to retailing. Retailers and technology companies see its tremendous potential and are joining hands to explore its applications.

2 Advanced Robotics

A robot is a mechanical or virtual device that can perform tasks autonomously or semi-autonomously, often mimicking human actions or responding to external stimuli. Robotics can be used in many ways: to automate labor-intensive tasks in warehouses, clean shop floors, deliver marketing messages in stores, and patrol stores to deter theft. Further advances in technology will enable them to do even more.

3 Internet of Things (IoT)

IoT in retail implies deploying networks of interconnected devices and sensors in stores, warehouses, and logistics centers, providing retailers with real-time data about customer behavior, store operation, and supply chain management that can lead to more informed and timely business decisions. IoT can be used in numerous retail scenarios such as waste reduction, inventory management, logistics optimization, and facility management.

By leveraging these emerging technologies, retailers can elevate customer experiences, optimize operations, and drive business growth and sustainability. However, it is essential for retailers to stay conscious of the potential downsides of these technologies and ensure using them responsibly. For example, retailers need to enforce strict governance on customer data and privacy protection, and to provide re-training and up-training to workers who are displaced due to deployment of advanced technologies. In this way, retailers can enjoy the full benefits of true **Green Digitalization**, not just digitalization as an end in and of itself.

Joining Forces for a Greener Future

Green Digitalization will create a faster, smarter, and greener retail industry, but this isn't possible without close collaboration between all stakeholders, including retailers, technology companies, consumers, investors, as well as governments and NGOs.

Retailers, having recognized the scale of the environmental and social impacts the industry has and the urgency to address them, are acting. Leading retailers such as Walmart, Ahold, and Woolworths have created Chief Sustainability Officer roles dedicated to leading their sustainability efforts. In 2016, Walmart signed up to the Science Based Targets initiative (SBTi). Since then, 276 retailers have done so, and among them 104 have made commitments to near-term targets. [4]

END NOTES:

1. GHG scope definition:

- Scope 1 are emissions directly from a retailer's operations.
- Scope 2 are emissions from energy and fuels purchased to support a retailer's operations, such as heating, lighting, refrigeration, and delivery fleet. As Scope 1 and 2 are under a retailer's direct control, they are the priority in a retailer's green efforts.
- Scope 3 are emissions that occur in a retailer's value chain, upstream to manufacturers and distributors, downstream to consumers and disposal. This scope typically accounts for the majority of retail value chain emissions, thus must also be tackled in order to achieve net zero and keep the climate to within the 1.5 degree Celsius change.

2. Hanshow and Intel, "Hanshow Works with Intel and Microsoft to Accelerate Smart Retail Innovation", whitepaper page 4, August 2022.

3. Eink, Eink 2022 Corporate Sustainability Report, page 64, published in July 2023.

4. SBTi, Companies taking action - Science Based Targets, accessed July 28, 2023.

About Hanshow

Hanshow is one of the global leaders in the development and manufacturing of electronic shelf labels and digital store solutions. The company offers a series of customized IoT touchpoints and digital store solutions that deliver customer-centric insights. Hanshow's solutions have provided services to a vast number of stores across more than 50 countries and regions, helping them streamline operations, optimize pricing strategies, and offer consumers a more personalized experience.

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