

THREE DATA-DRIVEN TECHNOLOGIES THAT ARE MAKING THE SUPPLY CHAIN MORE SUSTAINABLE

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While sustainability is important in the food and beverage industry, other business priorities, like food safety, sometimes take precedence. Recently, the pressure to maintain profitability in the face of economic uncertainty and labor shortages has further incentivized some food and beverage brands to focus on short-term gains rather than long-term sustainability goals.

However, food and beverage leaders must understand sustainability and profitability are interconnected. The perceived high upfront costs and lack of awareness about the benefits of sustainability can potentially deter businesses from integrating new practices. When organizations fail to see the value of implementing more sustainable processes across their operations, they risk missing out on long-term cost savings, improved brand reputation and increased customer loyalty.

That's why food brands must effectively implement sustainable

strategies as a key business objective. The right tools can support this process.

IoT, blockchain, predictive analytics and other sensor technologies can optimize efficiencies, reduce waste and promote transparency in food systems, helping organizations decrease their environmental footprint while increasing profits in the long run.

Challenges To Achieving Sustainable Operations In The Food And Beverage Industry

The complexity and magnitude of environmental concerns in food systems present significant challenges to building sustainable operations. Global food supply chains, for example, account for one-third of human-produced greenhouse gas (GHG) emissions each year. During a product's lifecycle, processes related to fuel and energy consumption, food production and transportation continuously emit gasses into the atmosphere. Cargo transportation

alone is responsible for 8% of global GHG emissions.

Along with supply chain activities, food waste negatively impacts the environment. A third of food in the U.S. goes uneaten, and food waste comprises 24% of landfills. Since most of the food supply chain still relies on legacy processes and technology, it increases the risk of under- and overproduction because it's more difficult to manage stock levels. Smarter tools and infrastructure can create an agile, connected supply chain to curb food waste.

In addition, food systems' environmental impact exacerbates supply chain inefficiencies. As severe weather becomes more common, the stability of the food supply chain is threatened. For example, severe weather events can disrupt crop yields, leading to unanticipated shortages.

When customers shop at grocery stores, they expect to find the

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products they're looking for on the shelves. But if food brands fail to properly manage inventories, weather events may lead to dissatisfied customers, ultimately impacting customer trust and sales.

Given the stakes, food brands have clear incentives to invest in technologies that make sustainable processes possible. Data-driven solutions with embedded AI capabilities can help inform decision making to increase efficiency and reduce waste.

Three Sustainability Technologies

Technologies like enterprise resource planning (ERP) software, transportation management systems (TMS) and warehouse management systems (WMS) can enable sustainable practices.

For example, ERP coupled with analytics allows food and beverage operations to access data-driven insights about resource use and waste production. Various smart solutions can empower brands with the information they need to prioritize sustainability while increasing efficiency.

More specifically, here's how three data-driven technologies can increase sustainable practices

across the food supply chain.

Sensor Technologies

Sensor technologies such as IoT-enabled devices capture granular data throughout supply chain operations, including inventory levels and environmental conditions. This enables organizations to gain end-to-end supply chain visibility from farms to consumers, helping them identify specific environmental challenges in their operations.

In addition to increased visibility, sensor technologies can help organizations prevent food spoilage. Through the integration of IoT-enabled devices in the supply chain, organizations can automate temperature monitoring and reporting during distribution, transit and storage—improving both efficiency and food safety.

Suppose a truck driver transports food items that must remain at cold temperatures. IoT sensors can monitor cargo environmental conditions such as temperature and humidity and alert both the source and the destination about variations in temperatures. With fast and accurate temperature readings, carriers can immediately take action to adjust the temperature and ensure affected products don't make it to shelves.

Blockchain

ERP, TMS and WMS systems can transfer real-time information via blockchain to improve product traceability. Increased transparency across all stages of the supply chain helps food brands mitigate the risk of expensive recalls, minimize food waste and optimize efficiencies.

For example, food organizations can incur high legal and financial penalties, tarnished brand reputations and loss of customer trust because of a mishandled product recall. However, with access to data from each stage of a product's lifecycle, businesses can more quickly and precisely identify safety issues in the food supply. By doing so, organizations can reduce waste by removing only the impacted products from the inventory.

Predictive Analytics

Predictive analytics, powered by statistical algorithms, machine learning, AI and internal and external data sources, can help organizations identify demand patterns and forecast future trends. Even more, food brands can leverage data-driven insights to optimize water and energy consumption and manage climate risks such as fluctuating weather patterns and natural disasters.

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Predictive analytics can also help businesses avoid overproduction. For example, certain food products are in high demand at specific times of the year, so organizations can plan accordingly. When products are in low demand, organizations can shrink or adapt operations to optimize stock levels and reduce waste.

Along with improving demand forecasting, predictive analytics

can optimize trucking and cargo shipping routes to increase fuel efficiency. Unexpected events such as traffic congestion and severe weather can delay deliveries, increasing fuel consumption in the process. Route optimization and backhaul software paired with AI technology allows for immediate rerouting and simultaneously collects data to inform future decision making. As a result, food brands can reduce fuel usage, prevent

perishable items from spoilage and deliver products on time.

It's a mistake to sideline sustainability, even in a challenging economy. Data-driven technologies with AI capabilities can help food and beverage businesses quickly transition to sustainability-focused decision making and practices—and allow them to reap the benefits of long-term efficiency and profitability.

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