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The future of restaurants: Digitizing supply chain and operations

New technologies and advanced analytics can illuminate, optimize, and orchestrate operations to unlock value

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Introduction

Deloitte's future of the consumer industry program has identified the implications of a transformed consumer industry, including a seismic shift in supply chain operations and logistics over the next decade. While businesses today depend on physical supply chains, they will likely need new virtual systems for digital goods and services in the future. Going forward, organizations may no longer have just a linear flow of goods but a series of interconnected components that create sourcing, production, and delivery networks. This is especially true for restaurants. In a 2021 survey conducted by the National Restaurant Association,[1] "95% of operators said their restaurant experienced supply delays or shortages of key food or beverage items in recent months."

To navigate increasingly complex value chains, restaurants will likely need to not only collect data across their operations, but also invest in comprehensive digitization journeys. Restaurants that prioritize supply chain and operations digitization today can create more agile, efficient, and resilient foundations that may be better able to withstand the inevitable supply market shocks. Leading organizations have already begun to transition toward the ultimate goal of "self-driving" supply chains. In this report, we'll take a deep dive into the shifting supply chain and operations landscape and highlight opportunities restaurants can capitalize on.

For additional restaurant insights and trends, see our companion report on the future of restaurants.

Digitization maturity stages

We envision companies' digital maturity to progress through three stages: **illuminate, optimize,** and **orchestrate**. Organizations often begin by investing in the ability to aggregate and present operational data in a format conducive to making business decisions, thereby **illuminating** the value chain. Many restaurants use a franchise and supply chain outsourcing model, which means that the necessary data may not be owned or easily accessible by the central organization. This outside party involvement can make the initial step considerably more complicated. However, we've typically seen positive returns for many different kinds of companies that invest in data visibility.

Once data is available in a usable format, organizations can unlock the ability to continuously monitor performance and **optimize** the value chain, from supplier selection to restaurant placement. Over time, we predict businesses will be able to transition from a human-driven operation to one in which their supply chain technology **orchestrates** and executes autonomously to identify and act on opportunities. Over the next decade, we anticipate that these "self-driving" supply chains will move from theoretical to ubiquitous. Restaurants should build their foundational capabilities today to avoid being left behind.

Figure 1. Digitalization maturity (10-year horizon)

ILLUMINATE

Provide data visibility across the value chain, organized in an actionable manner

OPTIMIZE

Utilize available data to optimize the value chain for maximum efficiency, resilience, and agility

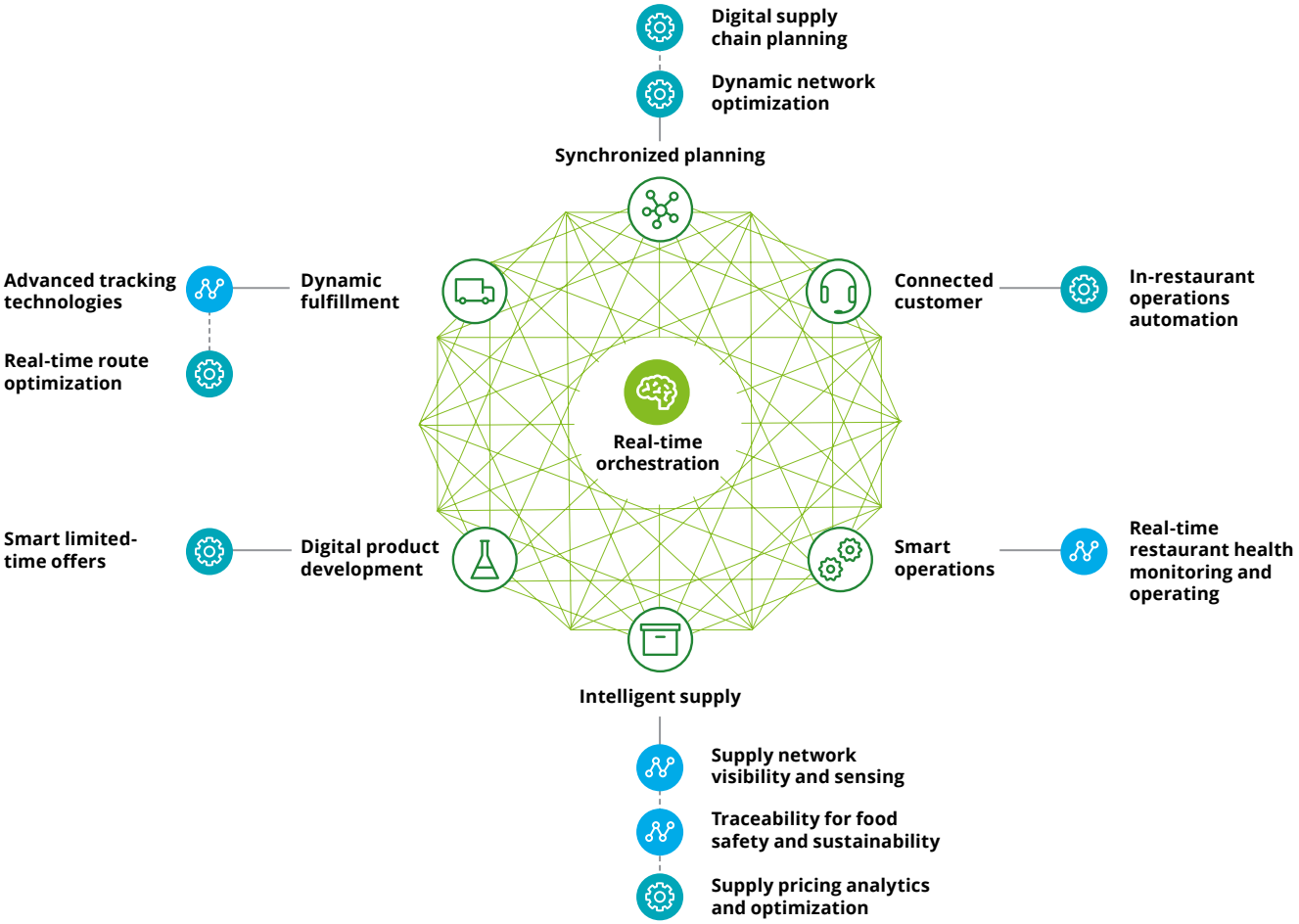
ORCHESTRATE

Enable a "self-driving" value chain capable of operating the supply chain with minimal human intervention

How digitization helps restaurants

Figure 2 illustrates specific ways we anticipate leading organizations will use digitization to enhance operations. For the remainder of this section, we'll examine each of these opportunities in greater detail.

Figure 2. How restaurants can utilize digitization for enhanced operations



Source: Deloitte Consulting LLP

Synchronized planning

For the most effective **digital supply chain** planning, restaurants can replace reliance on historic data with dynamic planning that draws from third-party data (e.g., weather) to predict demand. Additionally, rather than using static monthly or quarterly planning processes, we suggest analyzing restaurant point-of-sale data to adjust supply-and-demand plans in real time. All these capabilities can be supported by a digital foundry that contains the relevant data for these analyses.

Restaurants should also consider **dynamic network optimization using digital twins**. Digital twins, supported by cloud-based artificial intelligence (AI), use machine learning technology to allow users to run virtual simulations on complex networks. A restaurant organization could leverage digital twins to help drive decision-making on a range of topics, from the placement of its distribution centers to the way its restaurants are designed to maximize efficiency and customer experience, all with limited capital investment.

Dynamic fulfillment

Advanced tracking technologies can deliver more accurate inventory arrival predictions. Restaurants can keep close tabs on their goods in transit thanks to increasingly sophisticated radio-frequency identification (RFID) and Internet of Things (IoT) tracking technologies. RFID tagging can help restaurants identify in-transit inventory even when they don't own it yet. Investing in data capture from third-party providers could help illuminate the full supply chain. Another way to bring visibility to inventory logistics is to digitally monitor transport conditions, particularly for cold chain shipments. By installing sensors in transportation spaces, restaurants, food services, and logistics, providers can track potential issues (e.g., if a load is getting too hot or cold) and mitigate the problem in real time, reducing food waste and improving overall quality.

Real-time route optimization allows organizations to establish visibility into demand and routing data for logistics purposes and provides the capability to dynamically update routes for higher efficiency. This type of visibility also permits parallel testing, which helps logistics providers make routes more efficient by running simulations based on different permutations of loads, routes, and schedules. Organizations that implement these parallel testing techniques often see a 7% to 10% reduction in logistics cost due to reduced drive times. Reduced drive times, in turn, can lead to shortened lead times.

Digital product development

Restaurants can use analytics to plan and implement **smart limited-time offers (LTOs)** on menu items, which take advantage of supply and demand shifts identified by internal and third-party data sources. With better supply market analytics, restaurants can capitalize on price decreases to create LTOs. For example, a smart restaurant could identify a drop in beef prices and create a limited-time offer around it. Improved demand analyses can identify customer preference trends and indicate opportunities to use LTOs, as well as the specific geographic regions where they may be most effective.

Intelligent supply

Through **supply network visibility and sensing**, restaurants can track information about their suppliers—and their suppliers' suppliers. This gives them the capacity to detect upstream issues that might eventually affect their supply chains. For example, a restaurant that's reliant on a large food services provider could flag potential risks. Perhaps that large food services provider has only a limited number of suppliers for the restaurant's key menu item ingredients. With this knowledge, restaurants can diversify suppliers and avoid stockouts.

This ability to illuminate data from Tier N suppliers (the suppliers to your suppliers) is especially critical for restaurants that aim to expand into existing or new geographies. Better visibility and control over supply availability can allow for a smoother growth trajectory and better customer satisfaction.

Food safety-related data is becoming more systematized thanks to shared databases and blockchain, which allows **traceability for food safety and sustainability** measurements. Restaurants that use traceability data to address inventory issues such as food perishability have an opportunity to differentiate themselves from competitors. As IoT technology becomes more affordable, restaurants are digitizing their value chains to predict inventory shortages and monitor shelf life, cold chain compliance, and other food safety concerns that require near real-time visibility.

Supply pricing analytics and optimization provide additional intelligent supply benefits. Multi-variable customization models account for changing metrics such as shelf life, commodity pricing, contractual agreements, and seasonality when considering how and when to distribute purchases among preferred suppliers. With many restaurants exploring delivery model shifts, increased visibility into cost analysis can be key to understanding whether the margin, throughput, allocation, and overhead of an organizational change is advantageous.

Smart operations

Restaurants that can track information on their in-house hardware and online systems gain **real-time restaurant health monitoring and operational insights**, providing visibility into their organizations' staff, technology, inventory, refunds, and other key metrics. This allows them to proactively address issues and identify systemic trends in areas that affect their customers' experiences. For example, investing in sensors on critical equipment allows predictive maintenance to initiate repair orders and automatically deactivate affected online menu items in the case of equipment failure.

Connected customer

With drive-thru and delivery channel usage increasing, restaurants are rethinking their **in-restaurant operations automation**. To focus more on customer-facing interactions, restaurants may reconsider kitchen layout, flow, and drive-thru practices. But robotics and automation solutions can help restaurants save labor, drive overall efficiency, and allow staff members to focus more on customer-facing, value-added roles.

Digital core

Investments in the **illuminate** and **optimize** categories can pave the way for restaurants to become self-driving and implement **real-time orchestration**. This capability allows human supply chain planners to be taken out of parts of the decision-making loop. For example, an organization with real-time orchestration capabilities could automatically sense when one of its franchise locations was in danger of a stockout for a critical menu item ingredient. It could then recommend an inventory adjustment that a manager could review and approve in minutes.

The rise of generative AI will likely only enhance these capabilities. Think of the power of a generative AI client able to answer supply chain and operations questions in real time, on topics ranging from potential stockouts to alternative food suppliers. Ultimately, a self-driving supply chain can reduce costs and increase customer satisfaction, allowing restaurants to focus their human capital on strategic priorities rather than operational activities.

Conclusion

We've highlighted numerous opportunities for restaurants to take advantage of digital advancements in supply chain technology. Organizations should equip themselves with these emerging capabilities to stay ahead of and even benefit from the unprecedented changes to come.

We're here to help

Deloitte knows how to guide restaurant organizations navigating this shifting digital landscape. Please reach out to discuss your challenges—together, we can help you shape a vision for building a leading restaurant supply chain and operations organization.

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Endnote

1. Bruce Grindy, "Rising food costs and supply chain issues are creating challenges," National Restaurant Association, October 21, 2021.

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