Supply chain of the future: Key principles in building an omnichannel distribution network

As omnichannel shopping is becoming the new norm, consumer and retail companies must be ready to deliver fast, impeccable omnichannel service. Doing so requires a new supply chain network approach.

by Wolfgang Fleischer, Claudia Graf, and Tim Lange

The consumer product and retail landscape continues to evolve as companies race to catch up with leading e-tailers. Traditional brick-and-mortar retailers such as Macy's, Nordstrom, and Walmart are expanding their online offerings and introducing new models, such as in-store fulfillment of online orders. Online players such as Amazon and Zalando are opening their own brick-and-mortar stores. Vertically integrated players such as Bose, Burberry, and Nike are strongly pushing their direct-to-consumer business through both online and new physical stores. And players of all kinds are complementing their physical stores and e-commerce offerings with innovative applications and social media to mount a truly omnichannel presence.

However, many players still struggle with omnichannel success given the requirements it places on their supply chains—especially in terms of speed, complexity, and efficiency. Customers expect to receive their products anytime and anywhere with a very short time between order and delivery, with excellent service and high convenience. Our research shows that service represents the primary factor that brands and retailers can use to differentiate themselves and "delight" omnichannel shoppers.[1]

Companies that succeed, in our experience, master seven key building blocks of the omnichannel supply chain (see sidebar, "The seven supply–chain building blocks for omnichannel excellence").

In this article, we focus on building block number two, the network and ecosystem of the future, and describe the principles that can guide companies' approach to omnichannel network design in an increasingly complex environment.

The current e-commerce landscape

While apparel trails industries such as electronics and sporting goods in e-commerce penetration, the number of people shopping for clothes and shoes online is rising rapidly. This trend is true across regions. From 2014 to 2017, online apparel purchases grew at a CAGR of 24, 15, and 14 percent in Southern Europe, North and Western Europe, and Central Europe, respectively. In the United States, online apparel sales grew 18.5 percent in 2018 alone, to more than one-third of all apparel sales that year.[2] This growth far outpaced total apparel sales growth of 5.3 percent that same year. In China, total online retail spending grew 27 percent in 2018, with 24 percent of retail sales taking place online.[3]

Companies of all kinds, not only in apparel, are racing to meet customer needs—and adapting their supply chain is often one of the primary hurdles. Traditional supply chain networks are often not built for same-day delivery with excellent service. This is an issue especially when fierce competition offers shorter delivery times with a great customer experience; for example, Amazon continuously redefines delivery standards.

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[1] Holly Briedis, Tyler Harris, Megan Pacchia, and Kelly Ungerman, "Ready to 'where': Getting sharp on apparel omnichannel excellence," August 2019, McKinsey.com.
[2] April Berthene, "Ecommerce is more than a third of all apparel sales," Digital Commerce 360, July 23, 2019, digitalcommerce360.com.
[3] Satish Meena et al., "Forrester Analytics: Online retail forecast, 2018 To 2023 (Asia Pacific)," Forrester, May 15, 2019, forrester.com.

The seven supply–chain building blocks for omnichannel excellence

The omnichannel supply chain of the future has seven key elements that combine best practices with digital opportunities (exhibit).

Companies that achieve omnichannel success master seven key building blocks. The essential questions to ask for each element are listed below.

Customer–centric supply chain strategy

— Supply chain strategy and segmentation: How many supply chain segments are required to deliver the supply chain mission? What is the objective of each supply chain segment—responsiveness versus efficiency?

— Customer–backed service aspirations: What is the customer offering across different segments? Where does speed matter versus flexibility and services? How can we differentiate ourselves from competitors?

— Assortment and complexity management: How can we tailor the assortment to a retailer or to a channel (for example, online only)? How is the product portfolio managed?

— Risk management: What are the key supply chain risks? How can we best prepare for supply chain disruptions? What are the best proactive mitigation strategies and contingency plans?

— Sustainability: How can we create a sustainable supply chain using best practices, such as supporting the circular economy and using sustainable raw materials and packaging?

Network and ecosystem of the future

— Supply network: What is the physical flow of goods through the network? What are the different product–supply speed models, and what is the impact on the supplier and production footprint?

— Supplier management and collaboration: How are suppliers managed and integrated to support an agile upstream supply chain that responds quickly to changes, as required by the omnichannel customer?

— Distribution network: Is the distribution network designed for each channel individually or is an omnichannel network beneficial? What is the right composition of distribution centers (DCs), new node types, and partner locations?

— Inventory-sharing concepts: How can inventory be shared across channels? Does each channel have its own inventory? What is the best governance and business model for these concepts?

— Customer collaboration: What are key areas for customer collaboration that could improve information exchange and product flow along the value chain? Where should partners be employed to drive and access innovation?

End-to-end (E2E) planning and information flow

— Demand planning: What are the different demand signals in the omnichannel environment, and how can they be captured to predict demand potential by leveraging advanced analytics? How can we combine them into an E2E marketplace perspective?

— Inventory management: What is the optimal inventory level at each stage of the value chain—DCs, stores, partners, etc.? How can we actively manage inventory to increase availability and keep cash requirements under control?

— Supply and replenishment planning: How can we best synchronize the product supply with customer demand in stores, DCs, and with partners? Ensure the right amount of capacity along the different segments of the SC?

— Sales and operations control tower: How can we align the different organizational entities and plans at key milestones? Manage and decide on trade-offs? Allocate and prioritize customers, channels, and orders in case of constraint?

— Distributed order management: How can we ensure real-time visibility and accessibility of inventory across all channels and locations? Find and access the right fulfillment node to fulfill customer orders efficiently?

Omnichannel fulfillment: Node operations

— Warehouse management: How can we achieve warehouse excellence in a more complex environment? Leverage automation to increase speed, quality, and efficiency? Should DCs be operated in house or outsourced?

— Return flows and processing: How can we manage returns in an efficient and effective way? Optimize return flows across the network? Which decisions on flow of goods can be made by which parts of the value chain?

The seven supply–chain building blocks for omnichannel excellence (continued)

The omnichannel supply chain of the future has seven key elements that combine best practices with digital innovation.

Customer–centric supply chain strategy

Starting point to design an omnichannel supply chain that meets customer needs along all channels.

Network and ecosystem of the future

The supply chain's backbone—provides required speed and flexibility, leveraging information, and partner assets and capabilities.

E2E planning and information flow

Key information flow capabilities that access the right products in the right place at the right time—real-time—to deliver according to customer expectations

Operating model and change management

Key organizational enabler for the company and its people—captures supply chain potential and delivers exceptional customer value.

Omnichannel fulfillment: Node operations

Key physical flow capabilities that ensure competitive cost structures and reliable quality while managing complexity.

Digitization and process automation

Key technology enabler that uses available omnichannel data, analytics, and supply chain systems along the end-to-end value chain—and includes ecosystem partners.

Omnichannel fulfillment: Transportation and LSP management

Key physical flow capabilities that provide reliable, fast service to all customers where it matters, while ensuring competitive transport costs.

— In-store operations: How can we enable the whole downstream supply chain for omnichannel? Optimize in-store layout and processes to enable local fulfillment while securing a great customer experience?

Omnichannel fulfillment: Transportation and logistics service provider (LSP) management

— Transport management: What is needed to manage transport operations efficiently in an increasingly demanding world? How do we keep transport cost under control? Create end-to-end transparency of product flows?

— Logistics service provider sourcing and management: What are the right logistics partners for the different supply chain segments? How do we best source and manage LSPs to get competitive rates and services?

Operating model and change management

— Processes: How do we design supply chain processes to support omnichannel optimization? How can digital innovation be integrated in the process design? How do we accelerate decisions?

— Structures: How can we adjust the organizational structure to capture cross-channel benefits and make change happen? Avoid silos between channels? Use zero-based thinking in organizational sizing?

The seven supply–chain building blocks for omnichannel excellence (continued)

— Capabilities and mind-set: Which additional skills are needed to enable the future organization? Where should an agile way of working be used and how? How can we best address the cultural change toward omnichannel behavior?

— Performance management: How should performance of the E2E supply chain be measured? How can we incorporate the omnichannel dimension, measuring the joint performance rather than individual channels? Adjust incentives to enable the right behavior?

Digitization and process automation

— Foundational software: What is the required software and tooling needed to enable the omnichannel supply chain? Which optimization decisions need special tool enablement?

— Data strategy: How can we capture data and use it along the value chain? Build the omnichannel data lake to link the data from different platforms and systems? How are legacy systems integrated? How do we integrate into an ecosystem with our partners?

— Analytics strategy: How can we contextualize data to conduct relevant analyses? Is operational data consolidated and accessible by the right decision makers? How can we best visualize data and analytics to make them accessible to decision makers?

— Process automation: How can advanced digital tools such as robotic process automation, blockchain, and the Internet of Things be deployed? What are the key benefits of these technologies, and how can they enable omnichannel optimization?

In addition, e-commerce fulfillment is much more complex than traditional brick-and-mortar or wholesaler fulfillment. When customers can order 24/7, demand is less predictable and more difficult to shape. Order sizes are significantly lower, and the number of products offered continuously rises. The increase in speed and complexity drives up fulfillment costs. In our experience, an online order's cost per unit can easily be four to five times higher than traditional brick-and-mortar replenishment and ten times higher than wholesale fulfillment. All the while, customers demand a seamless omnichannel journey.

Building out the omnichannel experience can bring huge value for retailers, e-tailers, and vertically integrated players with direct-to-consumer business; our research has found that customers shopping online tend to buy more, and customers that pick up online orders in store often make additional in store purchases.[4] With the seven building blocks of a successful omnichannel supply chain in mind, the following principles should be top of mind while working to build the network and ecosystem of the future.

Put the customer's needs first

To start, companies need to adopt a granular perspective of what the customer really wants, today and in the future. This understanding will inform which channels to serve, which products and services to offer, and where to offer them. For example, a young adult living in a large city, such as London or New York City, wants to purchase and receive a newly launched sneaker that a celebrity presented on Instagram that same day. However, the customer does not know where she will be in a few hours, so it is important that she can track the delivery and reroute it at any time. If, for example, she goes to a café, the shoes are rerouted (via an app) to be delivered there.

Developing this detailed understanding of customers requires harnessing customer data. This information should be combined with customer-behavior insights culled from customer interviews, observations, and the latest research from market experts, as well as analyses of competitors' e-commerce offerings. Advanced analytics can be used to process all this information and gain a clear understanding of customer expectations.

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[4] "Employment situation summary," Bureau of Labor Statistics, October 4, 2019, bls.gov.

In an ever-volatile environment, speed of implementation and efficient use of resources are crucial.

In addition to understanding the customer today, companies must also look to the future and stay flexible as the market rapidly changes. For example, while next-day service was novel just a few years ago, it is common today. How future incumbents and disrupters will shape the market is still unknown. As such, serving the customer of the future requires unprecedented agility—quickly adapting to changing customer expectations.

Forget one size fits all

A deep understanding of customer desires should be the foundation of defining the strategy and building various customer segments based on preferences, product categories, and locations.[5] This segmentation recognizes that a one-size-fits-all approach is a waste of resources. A segmented approach enables the company to prioritize specific services for each customer group—for example, which speed of delivery to offer for each segment and which differentiated services to offer or not. While the London customer may expect same-hour service, customers living in remote areas might not mind waiting a few days. Developing this understanding to undergird the strategy is crucial to avoid common mistakes, such as offering convenience at a premium to customers that care more about price or building offerings that quickly become outdated.

Be fast and collaborative

In the traditional supply chain model, companies often choose a purely quantitative approach to model the perfect fulfillment network needed for the service offering. This generally involves a rather rigid and time-consuming approach: three months of data collection, six months of modeling, and three months of decision making before implementation. This traditional approach leads to a onetime strategy and long implementation times. However, in an ever-volatile environment with constantly changing customer needs, evolving partnerships, and newly developing competition, reacting quickly is critical to ensure that the supply chain network is responsive, flexible, and efficient.

Therefore, companies should remain agile in their thinking and assemble a cross-functional team. One best practice is to develop the future supply chain network in a workshop-based environment. In practice, this means determining the fulfillment options suitable for each customer, product, and location segment and defining the required product flow. Starting with the segment that has the most demanding lead time, the best fulfilment option needs to be found for each segment while considering operational needs, such as costs to serve and volume constraints. Once a solution for each segment in each location is defined, it must all be combined into one comprehensive service network.

Seek partnerships and share resources

In an ever-volatile environment, speed of implementation and efficient use of resources are crucial. Therefore, it is necessary to take advantage of existing infrastructure, such as warehouses and retail stores, as well as resources available in the

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5   Raj Kumar, Tim Lange, and Patrik Silén, "Building omnichannel excellence," April 2017, McKinsey.com.

market. Leading companies are actively seeking partnerships, not only along their own value chain but also with players from other industries. Sharing infrastructure brings synergies—costs and risk are split, for example—and enables better customer service and faster delivery times. For instance, a player operating department stores may offer in-store pickup services to e-commerce companies, and e-commerce companies can offer online order fulfillment to department stores. The partners would establish commercial terms for compensation, such as sharing the margin. Connected inventory is another example of using existing partner resources, enabling players to offer products that are already close to the consumer rather than putting additional inventory into the market. This can increase the availability of certain products with minimal effort from the retailer.

Look for innovative fulfillment options

When identifying existing assets within a company and their partners' networks, it is important to consider innovative fulfillment options. The types of fulfillment options a player regards as suitable depend on the specificities of the market and the company, but customer orders can be fulfilled in a variety of ways. Shipping products from a warehouse or distribution center is the most traditional and cost-efficient way. Warehouses typically have a higher level of automation, handle significant volumes, and seek locations that incur low operating costs, such as rural areas or industrial areas outside of large cities.

However, rising customer expectations for faster delivery have triggered the development of more innovative fulfillment options. Thus, one should consider that products can also be shipped directly from the production facility or dark stores—noncustomer-facing miniwarehouses usually within a city, where products are stored, picked, and shipped directly to consumers. Pop-up nodes are another option; for example, a container placed at a major sports event or a truck, van, or bike driving around

a city holding inventory and delivering products to customers who order via an app. Products could also be manufactured right where the customer is with, for example, 3-D printing techniques. The main advantage of these fulfillment options is proximity to the customer; however, operations are less efficient and more costly, and they require additional capabilities. Indeed, retailers have several elements to weigh when considering the variety of fulfillment options available to them (Exhibit 1).

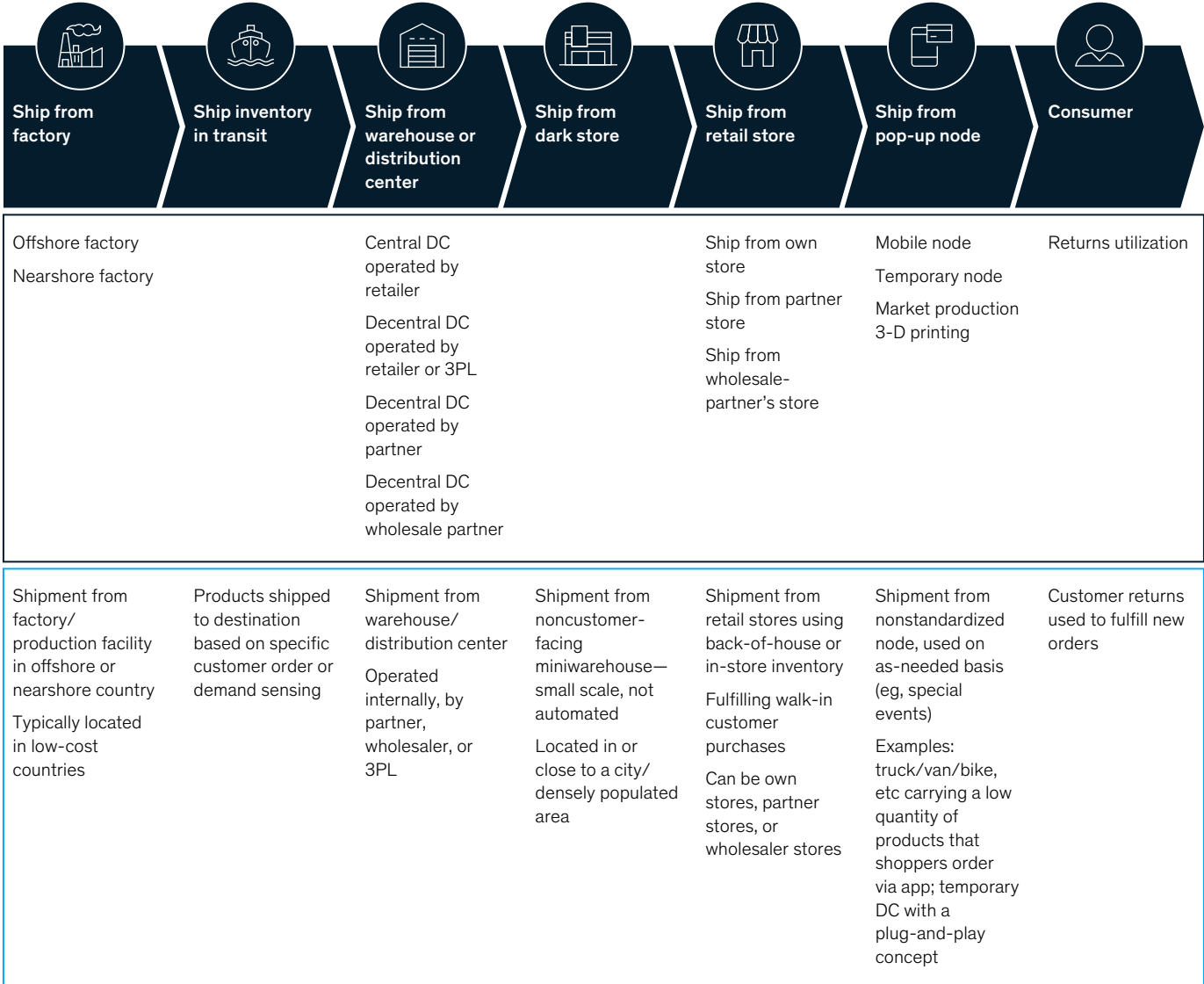### Think early about new capabilities and never stop learning

To enable the identified solutions, companies must carefully consider the new capabilities required to run their future network and understand how to build them. Those capabilities include physical flow ranging from operating new node types, such as dark stores and pop-up nodes, to managing new transport flows and partners, such as last-mile services. Information flow capabilities such as planning demand and inventory, stock visibility in the decentral node network, and distributed order management should also be implemented (see sidebar, "The seven supply–chain building blocks for omnichannel excellence"). For example, a new fulfillment solution such as shipping from a dark store requires new operational processes and systems to run a small-scale node efficiently and an agile and efficient structure that supplies it with small quantities at a high frequency. In addition, the planning landscape needed to have the right inventory in the dark store requires new capabilities, such as demand sensing, dynamic supply allocation, and capacity planning at each location. Finally, the dark store requires real-time and accurate inventory visibility combined with a distributed order management system that makes the stock available and accessible.

This connected fulfillment network should be deployed along an agile road map to enable quick testing and learning of different node types that include capabilities in various locations rather than

Exhibit 1

It is crucial to consider all elements when weighing fulfillment options.

Fulfillment option

— Different operational modes   — Description

Ship from factory	Ship inventory in transit	Ship from warehouse or distribution center	Ship from dark store	Ship from retail store	Ship from pop-up node	Consumer
Offshore factory Nearshore factory		Central DC operated by retailer Decentral DC operated by retailer or 3PL Decentral DC operated by partner Decentral DC operated by wholesale partner		Ship from own store Ship from partner store Ship from wholesale-partner's store	Mobile node Temporary node Market production 3-D printing	Returns utilization
Shipment from factory/ production facility in offshore or nearshore country Typically located in low-cost countries	Products shipped to destination based on specific customer order or demand sensing	Shipment from warehouse/ distribution center Operated internally, by partner, wholesaler, or 3PL	Shipment from noncustomer-facing miniwarehouse—small scale, not automated Located in or close to a city/ densely populated area	Shipment from retail stores using back-of-house or in-store inventory Fulfilling walk-in customer purchases Can be own stores, partner stores, or wholesaler stores	Shipment from nonstandardized node, used on as-needed basis (eg, special events) Examples: truck/van/bike, etc carrying a low quantity of products that shoppers order via app; temporary DC with a plug-and-play concept	Customer returns used to fulfill new orders

Lead time

High ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ Low

Degree of productivity

High ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ Low

Volume-handling capacity

High ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ Low

Inventory-holding capacity

High ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ Low

Cost of operation (eg, wages and rent)

Low ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ High

A global brand's omnichannel success

This global brand is becoming a strong omnichannel player and serving its own retail stores, wholesale stores, and e-commerce customers alike. Due to strong past growth—overall revenue grew by 9 percent and online penetration by 158 percent from 2012 to 2016—it was necessary to rethink the entire supply chain and work in cross-functional teams to define an omnichannel strategy of the future.

The company first conducted intensive market research, including interviews with end customers, store visits, and competitive analyses to understand customer expectations of omnichannel shopping and delivery. Customer segments were defined and tied with specific services and delivery times.

The company then defined the supply chain network to serve the customer segments. The company used the existing brand's player's and its partners' infrastructure to integrate traditional fulfillment options, such as central and decentral warehouse shipping. At the same time, it was important to be very close to the customer and replenish retail stores fast, which is why the solution included innovative fulfillment options, such as shipping from a dark store, retail store, or temporary node. The fulfillment network consisted of various individual solutions per location; for example, the company identified a partner e-tailer with spare room for additional inventory in a German warehouse close to major cities, whereas in Southern Europe it was necessary to establish a partnership with a department store and use its wider network of warehouses and stores.

The key to success was going beyond modeling and quantitative analysis to involve a cross-functional team that made sure all relevant elements were considered. For example, marketing ensured that customer expectations were always prioritized, the supply chain team assessed operational feasibility of fulfillment options, the logistics team played devil´s advocate on transportation costs, and the commercial team expanded the partner network.

The implementation road map was built in an agile way to allow for fast testing and learning. Individual elements could be piloted and evaluated quickly to decide if a fulfillment option should be scaled or taken off the solution space.

the traditional approach that initiates only when all node types and capabilities are fully developed. Building these required capabilities should also be planned in modular sequence. Regardless of how the omnichannel distribution network looks, it is important to stay flexible and adjust to any road map changes, such as an increase in customer requirements or new logistics service offerings— for example, delivery solutions for fast last-mile delivery. Testing, learning, and adjusting quickly should be the credo.

For an example of a retailer that found success in building a network and ecosystem of the

future, see sidebar, "Case study: A global brand's omnichannel success."

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Enabling a truly end-to-end omnichannel experience requires a new way of supply chain thinking. The supply chain needs to be readjusted based on changing market conditions, and players should pursue an agile approach that enables them to adjust quickly to changing trends, options, and customer expectations. These principles can help determine the approach to building the network and ecosystem of the future.

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