White Paper

Leveraging Next-Generation Connectivity, Platforms, and Solutions to Transform Supply Chains

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IDC OPINION

The COVID-19 pandemic has exacerbated supply chain challenges around the world. The pandemic's initial shocks, which were first felt globally, eventually caused marked shifts at local levels. The pandemic has forced upstream players (i.e., global suppliers and distributors) to rethink and transform their processes in response to downstream shifts. For example, players now recognize a drastic need to fulfil customer requirements online.

In the space of a few months, upstream players began to identify and work with regional and local players, thereby altering the complexion of supply chains and logistical and retail processes. At the same time, downstream retailers that had hitherto only operated physically scrambled to position themselves online. The number of couriers and delivery companies serving the last mile also rose.

In a bid to address the geographic spread of customers and ensure timely delivery, downstream players have been considering dark stores (i.e., warehouses dedicated for online orders) and micro-fulfilment centers, especially for consumer goods. However, these moves will add layers to the supply chain that require their own systems for maintaining visibility and leveraging customer data generated in multiple ways.

Prior to the pandemic, supply-chain companies were looking to enhance existing systems and address challenges related to visibility, demand forecasting, order processing, and quality control via the use of technology. Following the pandemic, players now have an additional need to be resilient and agile in order to deal with ongoing shifts and face any future disruptions.

In this context, entities in the supply chain sector should carefully consider applying core technologies such as robotic process automation (RPA), artificial intelligence (AI), analytics, and augmented reality (AR). IDC believes that such technologies can help them address existing challenges and achieve positive outcomes.

5G and Wi-Fi 6 connectivity options — inasmuch as both are still nascent — should also be considered for various networking needs, particularly as they underpin Internet of Things (IoT) applications in the supply chain (such as tracking and monitoring applications at the warehouse and retail levels).

IN THIS WHITE PAPER

This IDC White Paper intends to foster discussions among different players in the supply-chain, logistics, and retail spaces by looking at some of the challenges faced, including those arising during and after the pandemic. The paper looks at the changes that have taken place in the industry and outlines different technological interventions that players can make to address ongoing challenges, foster greater collaboration, and achieve the agility and resilience needed to handle future disruptions.

SITUATION OVERVIEW

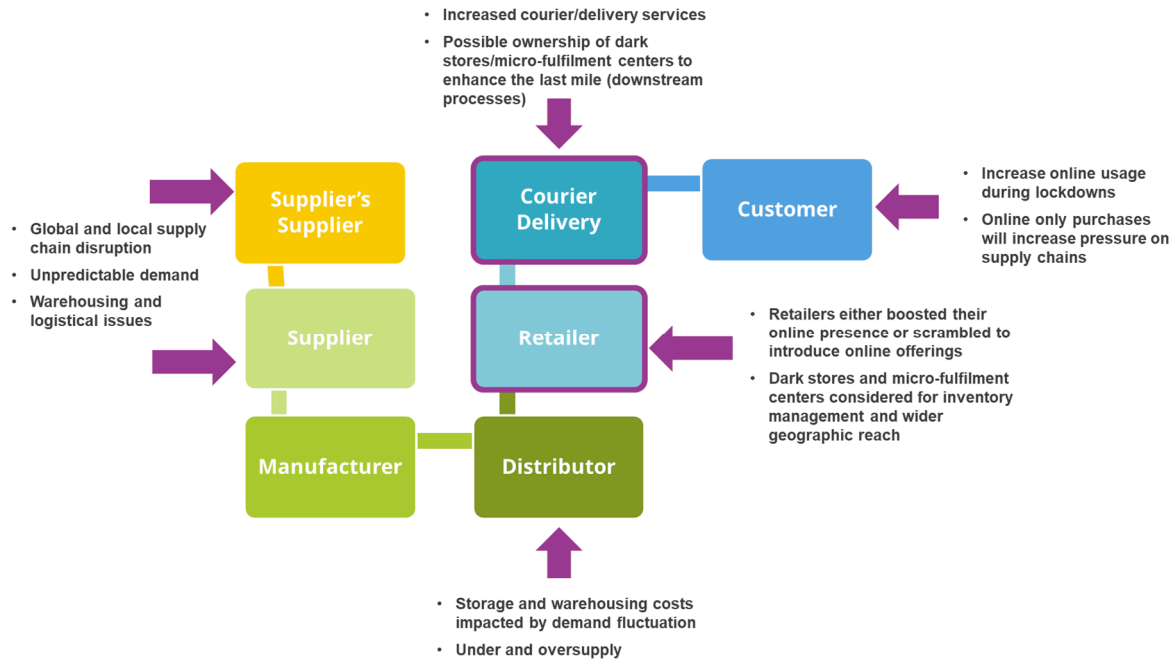
Supply chain management (SCM) systems have evolved steadily over time. In the early days of manufacturing, discrete systems were used for fleet, materials, labor, finance, procurement, and plant and equipment management. Later, these systems evolved into fully integrated enterprise resource planning (ERP) solutions which, in some cases, supported electronic data interchange between suppliers, manufacturers, and retailers.

These systems were initially upgraded to improve operational efficiency, reduce manufacturing costs, and optimize processes. Over time, they were equipped with more features to address specific issues (such as route planning for distribution, wastage reduction, product tracking and monitoring, and visibility into costs and revenue).

Although there are advanced ERP systems that focus on the broader supply chain, logistics, and retail sectors, the global pandemic has exposed a serious lack of resiliency in distribution networks. There is now a greater need to address existing supply challenges as the impact of the pandemic spreads from the global to the local level.

FIGURE 1

The New Reality of Supply Chain Disruptions



Source: IDC, 2021

Global movement restrictions have underscored the need for manufacturers to source supplies ether locally or regionally. At the same time, local lockdowns have triggered a rise in virtual purchases, which in turn have caused a surge in the number of players in the ecommerce ecosystem (such as those offering online products or specializing in the delivery of different products). Players that only have brick-and-mortar strategies have similarly scrambled to gain a virtual presence.

There have also been gradual changes in logistical processes and the methods distributors and retailers use to reach their customers. Accordingly, the number and roles of players in the supply chain industry have increased dramatically following the onset of the COVID-19 pandemic. These numbers continue to change as the world recovers from the initial pandemic shock.

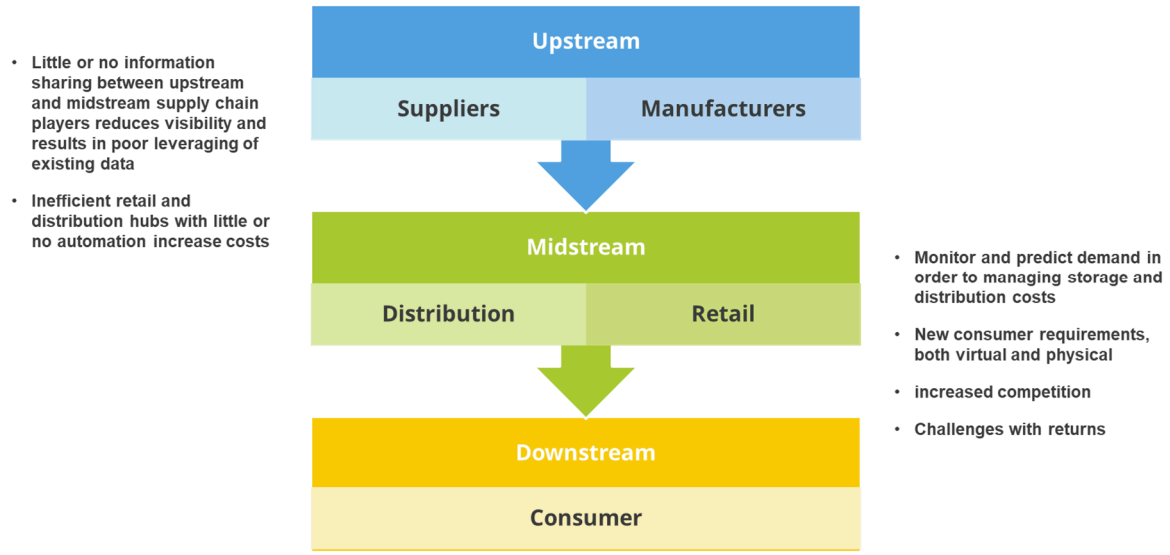
The most significant change has been the accelerated adoption of online and mobile channels by consumers. This adoption, which was already occurring before the pandemic, has grown exponentially due to forced movement restrictions and social distancing requirements. The use of online and mobile channels has had the greatest impact on the retail sector, with a growing supply-side ecosystem and many new providers in the logistics space.

Moreover, consumers now have a greater need to understand the origins of goods, as well as how goods are stored and handled, given their health concerns about COVID-19.

Prior to the pandemic, supply chain players had limited visibility into costs; there was also inadequate or no information sharing between players. This lack of information sharing not only lengthened consignment deliveries but also impacted a supplier's ability to forecast demand, resulting in storage and other logistical problems.

FIGURE 2

Supply Chain Challenges



Source: IDC, 2021

With international consignments, a lack of visibility led to difficulties while goods were in transit. This was especially hard for mid-stream players needing to allocate warehouse space at various junctures of the journey. Presently, shipments typically arrive at a destination port, where decisions about their onward conveyance are made on the spot. The inspection and assessment of goods on arrival was another customs requirement that presented a hurdle – the timing of such processes was never definitive, limiting the ability of players to plan their deliveries.

FUTURE OUTLOOK

There are some emerging trends and developments in the supply chain industry and a few enhancements to existing ICT systems that are being considered by supply chain players. These trends and enhancements are applicable to a wide range of country markets such as South Africa.

Micro-fulfillment centers and dark stores for certain products present an additional dimension to the supply chain and are increasingly being considered as options by certain players. To simplify the supply chain, some current ecosystem players (like retailers and courier companies) may elect to own and operate such centers to serve wider geographies, support producers, or extend the reach of brick-and-mortar facilities (as these facilities may not be accessible to certain customers).

As more and more consumers go online in the coming months and years, manufacturers and producers may partner with entities that provide nontraditional stores (e.g., dark stores and micro-fulfilment centers). Such centers may also help enhance quality of service by shortening fulfilment times, as products can be strategically located closer to where demand exists.

There are several core technologies that are being considered to augment and enhance existing supply chain systems. These technologies can address ongoing challenges and deliver new benefits (such as better geographic and customer segmentation, increased visibility into the supply chain, cost reduction, and waste and returns reduction). Some of these technologies are shown in the table below.

TABLE 1

Core Technologies for Supply Chain Transformation

Technology	Applications
Augmented Reality	Warehouse processes, remote inspection of cargo, tracking assets, consignment location, troubleshooting, training
AI and Machine Learning	Forecasting and demand planning, productivity, quality control
RPA	Order processing, shipment scheduling and tracking, invoicing, demand forecasting, customer service
5G (and IoT)	Supply chain logistics visibility, location feedback, surveillance, event detection, IoT, enabling AR applications, electronic lock systems (for customs), tamperproof tracking devices
Wi-Fi 6 (and IoT)	Warehouse management, IoT, location goods, condition monitoring for perishable goods

Source: IDC, 2021

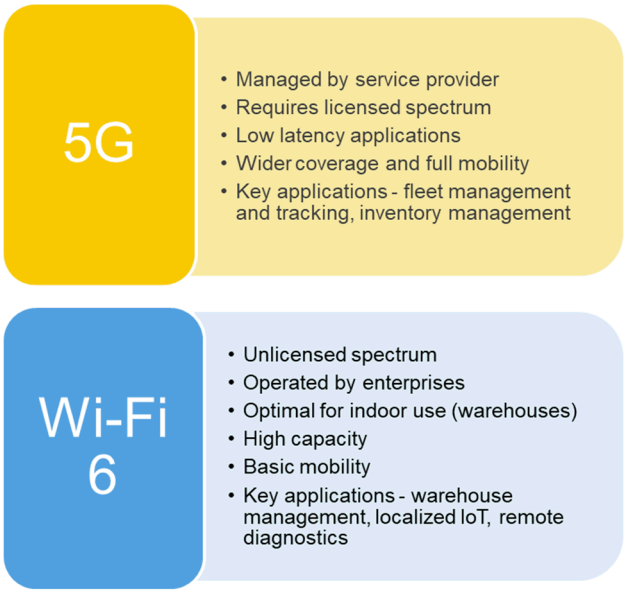
5G and Wi-Fi 6 in supply chains

Supply chain players are increasingly considering 5G and Wi-Fi 6 connectivity to support various applications along the supply chain, with each having its merits. 5G technology can underpin applications that require low latencies and wider coverage (such as fleet and inventory management and tracking). Meanwhile, Wi-Fi 6 can mainly support LAN applications, including those at the warehouse level. While 5G is managed and operated by service providers (mobile operators), Wi-Fi 6 is managed at the enterprise level.

While 5G and Wi-Fi 6 are both suitable in the supply chain space, their use may largely depend on several factors (e.g., the particular applications used in sections of the supply chain).

FIGURE 3

5G and Wi-Fi 6 in Supply Chains



Source: IDC, 2021

CONCLUSION

Enterprises are encouraged to assess their current systems and identify areas where new technologies – and the data accruing from them – can yield useable business insights. In fact, different data can be used to generate business insights and enable information exchange via application programming interfaces.

Depending on their position in the supply chain, players should seek to identify technologies such as 5G, Wi-Fi 6, augmented reality, analytics, and RPA that can address current challenges such as the need for visibility into processes and cost. These technologies can also enhance quality and speed, thus helping supply chains become more efficient. Players can further use these technologies to understand changing customer trends and gain timely and actionable insights about minute developments in the consumer space.

Enterprises must also identify service providers and partners that not only possess an in-depth understanding of supply chains but also have the skills and experience needed to align emerging technologies to existing systems. By doing so, they can achieve immediate benefits while remaining agile enough to adapt to any future disruptions.

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