The future of logistics
Companies are facing an age of unprecedented change as innovation and technology disruptions take hold and as customer expectations evolve. New technologies are enabling greater efficiency and more collaborative operating models. Supply chains are becoming unbundled and customized to meet evolving customer needs and to reduce costs.

In the future, the role logistics plays within the supply chain will need to change to maximize the value of the digital investments companies make. Logistics will shift from taking the form of undifferentiated structures to more specialized solutions tailored to different customer segments, modes of transportation, warehouses, and distribution networks.

Importance of logistics trends

The rise of online shopping, customer delivery expectations of near-instantaneous fulfillment, forward-thinking pickup, and restocking processes have changed to remain at the forefront in customer service. COVID-19 forced social distancing, which resulted in of thousands of stores, restaurants, and other consumer services to shut their doors. Nonessential retail foot traffic fell about 80 percent at its lowest point. April U.S. retail sales fell a record 16.4 percent from March and were 21.6 percent below the April 2019 level.¹ See below how COVID-19 has changed the way we shop.

Quarantined consumers relied on e-commerce as a resource for their shopping needs, including groceries. A survey of 1,100 adult consumers showed 60 percent of respondents are doing more shopping online than in-store since COVID-19. Even after the coronavirus is under control, two-thirds of respondents expect to continue purchasing items online. Before COVID-19, 44 percent of consumers shopped online.² The epidemic has put e-commerce adoption on a fast-tracked trajectory. In 2019, UBS projected e-commerce would reach 20.8 percent of total retail sales in 2023, up from 14.4 percent in 2018. However, with early adoption due to COVID-19 lockdown, UBS expects e-commerce will jump to 25 percent of U.S. retail sales in 2025.³

Source: Safegraph, C&R Research, “Foot Traffic Data” (December 2020).

¹ Safegraph; Source: Safegraph, C&R Research, “Foot Traffic Data” (December 2020).
³ Sources: Retail and Internet UBS Interactive Model: More eCommerce Share Gains Ahead (November 5, 2019); U.S. Retail We Expect 100k Stores Will Close, UBS Securities (April 20, 2020).
Despite the lack of shoppers and foot traffic, the next phase of the “retail apocalypse” could be stores reborn as e-commerce warehouses. Large retail stores, such as Sam’s Club, are changing how it does business. The entire building in Lumberton, North Carolina, was converted into an e-commerce fulfillment center where orders from online shoppers throughout the Southeast are picked, packed, and placed on trucks that take them to shipping hubs. Instead of the parking lot full of customer vehicles, the lot is full of tractor-trailer trucks. On the inside, what used to be wide isles filled with shoppers pushing carts is now floor-to-ceiling ceiling shelves packed densely with goods being picked from by employees and shuttled to conveyer belts. Although no shoppers or cash registers are present, surprisingly, total employment is up. Before the pandemic, the store employed 164 workers, one-quarter working part time. Now nearly 300 full-time employees are working across three shifts. Many big retailers, including Walmart and Target, are becoming part of the new trend by taking the approach of directly shipping from the store or offering curb side pickup.4

In order to fully understand how to remain competitive in the logistics industry, companies must understand the challenges, future logistics trends, and the impacts of how technology game changers can revolutionize the state of their businesses. Following COVID-19, we will undoubtedly see a new era of logistical changes originally rolled out to support frontline workers, including truck drivers and warehouse workers, during the crisis. If businesses fail to adapt and evolve to these changing trends and offerings, they will struggle to advance in the industry as competitors will take over market share.

Key challenges and trends

Leaders in the logistics industry continue to receive pressure from regulatory entities at the government level all the way to meeting increasing customer demand. Given increased regulatory burdens, such as the EPA’s Cleaner Truck Initiative, fuel emissions are going to be critiqued more than ever. As seen during COVID-19, there is an increasing reliance on e-commerce demands. The need to build out these robust technology platforms for future industry impacts is critical to success.

Four common challenges facing the future of the logistics industry:

1. A need to develop a roadmap with future operations including sustainable and environmental regulations as long-term goals
2. Significant changes to business models driven by combination of technological market forces
3. Limited insights into future-state advanced data and analytics
4. Extensive inventory processes.

As demand has changed and customers increasingly expect deliveries to be completed faster, companies in the logistics and distribution world have leveraged technology improvements to stay ahead of the competition. At the same time, labor costs have increased, pressuring margins, just as shareholders have come to expect ever greater financial results. To meet the above challenges, companies have looked to innovative technology as the biggest opportunity to improve, reduce costs, and to have a positive impact on their carbon footprint.

Three technological trends receiving the most attention:

1. Drone technology
2. Autonomous and electric vehicles
3. AI and ML systems.
Inventory sits idle 90 percent of the time in a supply chain. Manual inventory checks are repetitive, time consuming, inaccurate, risky, and expensive. As demonstrated during the onset of COVID-19, we will see an increased swing in product inventory for items such as toilet paper and lower-inventory stocks. Automated inventory checks powered by drones provide accurate, fast, safe checks and can be performed more regularly than staff-intensive manual counts. However, flying them indoors has been an as-yet-unsolved challenge. By teaming with a drone startup, we have architected a drone solution that can operate in GPS-deprived environments to reliably obtain machine-readable images, which can be further analyzed for extracting insights based on client use cases. Recently, KPMG has successfully flown drones in a mock-store of a large retail company. The team is currently working on identifying and replacing out-of-stock items in a live store environment. Inventory counts done by drones are made possible through the following process:

Before drone cycle counts, a team of eight people with handheld scanners and forklift trucks will need three days to complete a cycle count. After introducing drone cycle counts, the complete inventory can be scanned in only two days. A businesses success is largely dependent on how it manages its data. Millions can be saved by refining a simple process to maximize efficiency. An example of this process refinement is the drones used by Exponent, a drone startup that is making use of advanced RFID tags to track products. In a test Exponent performed, over a 30-day period they had lost zero products using RFID tags and drone readers. In comparison, a sample of non-tagged product resulted in a 33% difference of product lost during testing. Cycle counting of large warehouses that contain numerous above head height is where labor and time saving benefits will be most evident for drones. By avoiding forklift trucks, warehouses can conserve energy and additionally help avoid safety risks.

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Risks

- Autonomous drone flying in indoor environments is advanced technology and comes with associated risks of being first to market.
- Large amounts of training data will be required to improve error rates for image analytics and to improve client-specific models.
- Audit risk: PCAOB is yet unclear on how images collected remotely can be used during an audit.
Case study #2: Contactless delivery services

A rise in home deliveries will drive demand for commercial vehicles. This may accelerate new adoption of innovative delivery including drone and van designs. Startups feature electric power trains and autonomous technology, eliminating the need for a driver and reducing the risk of accident, damage, or infection. These deliveries can largely affect rural areas where driver time between individual drops can be inefficient or in cities where congestion is an issue. Sixty-one percent of organizations that are effective at using digital technologies see higher revenue growth than their competition.

Drone parcel delivery is only a few years away from becoming a reality. Before these deliveries are in place, there are several logistical ways to receive a package: teaming with a logistics company to receive standard shipping in five to seven days at no extra cost, two-day shipping, or one-day shipping at increasing costs. The other option is free in-store pickup, which requires the customer to make the effort and incur fuel costs to pick up the item given availability. In the world of drone deliveries, a last-mile, low-cost delivery can translate into instant customer gratification and cost savings. It costs 10 cents to deliver a 4.4 pound package over six miles using a drone while it costs $5–$13 or more using ground transportation. This is the main reason why higher-than-expected costs cause consumers to abandon an online shopping cart.

Another major problem stems from enhancing the overall customer experience by getting the product to the customer quickly and efficiently before they start to question where it is. The State of Mobility in Transportation and Logistics report found almost three-quarters of their respondents 73 percent agree their company has outdated technology and also view the last-mile delivery process as the most inefficient process in their supply chain organization. Fifty percent of C-suite respondents said outdated technology has caused or will cause them to lose customers. According to research by CapGemini, last-mile delivery costs account for 53 percent of the total costs of shipping and up to 41 percent of the total supply chain costs. Half of the delivery and supply chain costs are spent on the final mile. By evaluating an efficient last-mile delivery option, logistics companies can compete in the new e-commerce and retail market.

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9 Source: Insider, Cooper Smith, BI Intelligence, “Amazon’s delivery drones could make 30-minute deliveries a reality (and for a $1 fee)” (April 2015).
10 Source: SOTI, “The Last Mile Sprint: State of Mobility in Transportation and Logistics”.
11 Source: Capgemini Research Institute, “The last-mile delivery challenge” (January 2019).
Case study #3: AI and autonomous logistics operations

AI and ML (Machine Learning) are at the core of autonomous trucks, drones, and the processes of automated warehouses. While the world may be excited about the prospect and advancements made in drones and trucks, it is within the closed environments of warehouses, factories, and distribution centers that much of the testing and implementation of these technologies has thus far taken place.

To get to autonomous technology will take time, as continuous, repetitive steps must be manually put together. In fact, this is the only way in which AI can grow. By recognizing similar shapes, patterns, and layouts, the technology starts to get smarter, hence the machine learning definition. For drones, this means interpreting tags around a warehouse until it fully learns the correct route to fly.

For trucks, this means understanding a stop sign versus a yield sign while making small distance drops. In the early stages, a human will be required to operate the technology. Autonomous vehicles have enough machine learning programming to not need a human operator. However, semiautonomous vehicles are in the process of machine learning, making headway towards being fully autonomous. Drones and trucks can fall into either category depending upon their machine learning capabilities. In order to visualize how these future technological changes can play a role in the logistics industry, please see the roadmap below.

### Industry roadmap

#### Future of logistics

<table>
<thead>
<tr>
<th>Inventory cycle counting</th>
<th>Drone logistics</th>
<th>Trucking logistics</th>
<th>Warehouse management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual counting</td>
<td>Driver delivery</td>
<td>Decentralized fleets</td>
<td>No automation</td>
</tr>
<tr>
<td>Barcode RFID assistance</td>
<td>Standard shipping</td>
<td>Centralized fleets</td>
<td>Warehouse robotics</td>
</tr>
<tr>
<td>Manual technology assistance</td>
<td>Expedited shipping</td>
<td>Electric fleets</td>
<td>Semiautonomous warehouse</td>
</tr>
<tr>
<td>Autonomous drone counting</td>
<td>Drone delivery</td>
<td>Autonomous fleets platooning</td>
<td>Artificial intelligence</td>
</tr>
</tbody>
</table>
Future outlook

Logistics businesses of the future will perform many of the same functions they have for generations—they will help companies to replenish demand; keep goods in storage ready to quickly meet orders; provide value to manufacturers and consumers in transporting goods where they need to be; handle returns; and share data used for billing, forecasting, and planning across all parties. As we move into the 2020s, these activities will increasingly be driven by big data and technology advancements as well as by the increasing and changing demands of customers, partners, and shareholders.

The time is now for all links in the supply chain to improve their data capabilities. It is a must to prepare for and accept advances in technology to stay competitive and to meet or exceed customer expectations.

The effects of COVID-19 have already shown there will always be another crisis. It is not a matter of if but when it will occur. One day, we might be moving from what is a trend to an immediate need. Therefore, it is important to be well positioned to help the acceleration of these technological advances.

Depending on the industry and the financial situation, these technologies may even accelerate their pace of adoption within one to two years. Most companies right now are putting off major capital expenditures and meanwhile shifting into a strategic planning mode by investigating these trends, their use cases, and the benefits so they can be ready to deliver when the time comes.  

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Table 3: Technology in use today vs. predicted use in 5 years

<table>
<thead>
<tr>
<th>Adoption trends predicted use</th>
<th>In use today</th>
<th>Projected five-year adoption rate</th>
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<tbody>
<tr>
<td>Cloud computing and storage</td>
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<tr>
<td>Sensors and automatic identification</td>
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<td>Inventory and network optimization</td>
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<td>Robotics and automation</td>
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<td>Predictive analytics</td>
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<td>Internet of Things</td>
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<td>Wearable and mobile technology</td>
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<tr>
<td>3D printing</td>
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<tr>
<td>Autonomous vehicles and drones</td>
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<td>Artificial intelligence</td>
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<tr>
<td>Blockchain</td>
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</tbody>
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Digital transformation investment
In 2020 and beyond

At the end of June 2020, a research study, conducted by IFS Industries found 52 percent of companies plan to increase their spending on digital transformation. However, future investing plans differ by industry.

The survey found 75 percent of respondents in construction will invest this year, followed by information technology 58 percent and manufacturing 55 percent, Energy 37 percent and retail 35 percent are more cautious investors. The study shows companies are using the global downturn as a pivot to leverage their resources for technological renewal and innovation.

As many businesses are adapting and adjusting to the economic recovery, there is reason to believe a progressive mindset towards technology investments will well equip companies to rebound.\(^\text{13}\)

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How KPMG can help

KPMG can help organizations develop a strategic approach to logistics strategy and design—enabling reduced costs and improved service and providing the ability to adapt quickly to ever-changing business environments. We can help your business understand how to capitalize on opportunities, quickly enter new markets, and grow profitably.

Our staff has helped companies in the transportation, manufacturing, warehousing, and fulfillment spaces to optimize their supply chains and to leverage the advantages offered by new technologies. Previous successful engagements include transformations of distribution and fulfillment functions to leverage new technology offerings within both transportation management systems and warehouse management systems.

KPMG offers experience in using technology to improve processes such as inventory cycle counts, including through the use of drones or robotics. Our data scientists can create ML algorithms to extract value in order to fully learn where the most opportunity is for robotic warehouse efficiency.

Our professionals also have extensive experience in total cost of ownership studies and control tower configurations, and we can help your company set up a supply chain digital maturity assessment to modify new technologies tailored to your needs.
Contact us

Brian Higgins  
Principal,  
Supply Chain and Operations  
Practice Lead KPMG LLP in the U.S.  
T: 312-665-8363  
E: bhiggins@kpmg.com

Yatish Desai  
Principal, Advisory  
US Logistics & Distribution  
T: 440-725-8547  
E: ydesai@kpmg.com

David DeStefano  
Director, Advisory  
US Supply Chain & Operations  
T: 919-622-7299  
E: ddestefano@kpmg.com

Michael Pfeifer  
Senior Associate Advisory  
US Supply Chain & Operations  
T: 224-612-3007  
E: michaelpfeifer@kpmg.com

Brad Walentukonis  
Associate Advisory  
US Supply Chain & Operations  
T: 267-221-5445  
E: bwalentukonis@kpmg.com

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