



The Future of Logistics: Gaining Competitive Advantage via Increased Agility

 **BlueYonder**
Fulfill your potential™

Five forces are reshaping logistics.

Forget what you knew about logistics. Even before the emergence of COVID-19, next-day and same-day delivery promises from mega retailers, as well as new delivery models such as store pick-up, were driving increasing customer expectations – not just in retail, but in every industry. Every day, retailers and manufacturers are challenged to balance ambitious customer service promises with profit margin protection.

Because warehousing and transportation represent significant cost centers, intelligent logistics decisions are critical. And, more than ever, these decisions have to be made on the fly, in real-time. As logistics managers grapple with their own challenges, including labor shortages and emerging commodity marketplaces, the logistics function has never been under more pressure to deliver.

The good news? The availability of real-time data, highly scalable ingestion engines, elastic public clouds, open application program interfaces (APIs), machine learning (ML), and artificial intelligence (AI) is creating new ways for logistics professionals to solve problems, establish resilience, and make optimal decisions in real-time.



#1

Ever-faster fulfillment speeds, driven by rising consumer expectations

#2

Direct-to-consumer sales models in which logistics is a critical advantage

#3

Labor shortages, and the increasing availability of automation and robotics

#4

New commodity marketplaces for sourcing transportation, warehouse space, and labor

#5

A shift from rigid business rules to real-time flexibility driven by AI and ML

Agility has never been more critical.

Today's business reality seems impossible to manage: extreme demand volatility, a never-before-seen focus on customer centricity, and increasing disruptions.

In this environment, where conditions change from moment to moment, agility has become the new competitive differentiator. Sudden demand spikes, precipitous demand drops, supply disruptions, production line shutdowns, and other events can only be managed via early prediction and real-time responsiveness.

With COVID-19 dramatically accelerating ecommerce and omnichannel sales efforts, logistics teams are focusing on how they can drive lower costs, while still leveraging agility as a competitive advantage. Not only are they exploring exponentially more complex transportation and warehousing schemes, but they're implementing a range of powerful technology solutions to digitize their distribution networks.

How does digitization support logistics agility? By making frameworks as seamless as possible, increasing collaboration across organizations, and enabling both inbound and

outbound visibility and control. Forward-looking logistics organizations understand that digital transformation is their means to reinvent themselves, leapfrog the competition, install real-time responsiveness, and establish themselves as strategic, long-term partners with their customers.

Agility means the logistics function must fundamentally change:

- It must be capable of responding to every customer order as a connected, yet singular, entity.
- It must be flexible and adaptive to real-time changes.
- It must make intelligent decisions, autonomously, that strategically balance cost and service.



Enabling agility via advanced technologies.

The five advanced technologies highlighted below are emerging as competitive imperatives in establishing agility and resiliency across the logistics organization. Whether they're retailers, manufacturers, or third-party logistics providers, companies must adopt and master these five technologies in order to:

- Identify and manage disruptions
- Deliver ecommerce-caliber service levels
- Implement successful omnichannel strategies and business models
- Achieve end-to-end visibility and control
- Make optimal decisions that protect profit margins

The innovations enabling this crucial change include:

Human + Machine

Robotics, cobots, drones, and warehouse automation improve productivity and reduce human errors

IoT and Telematics

Detection and monitoring tools increase real-time visibility, improve quality, and support optimal decisions

Autonomous Vehicles

Driverless trucks, forklifts, and drones deliver enhanced efficiency and safety

Collaboration and Connectivity

Digital partnerships increase visibility and responsiveness across the logistics network

Intelligent Problem-Solving

Advanced algorithms, AI, and ML detect and manage issues autonomously

Human + Machine

Increasing productivity, accuracy, and agility via robotics and automation

An emerging trend is for humans and machines to work together in seamless, fluid ways – where the best resource is chosen for the task at hand, in real-time, as conditions change. Leading logistics teams are leveraging robotics, collaborative robots or “cobots,” drones, and a variety of automation tools such as picking bots to complement their human capabilities. The results include improved accuracy, productivity, and agility in their warehouses and other facilities.

Logistics leaders are also adding AI, ML, smart machines, and IoT solutions to their digital toolboxes to support more intelligent, more responsive operations. Smart orchestration engines continuously monitor new orders and other changes, then apply constraints such as asset availability, human skillsets, employee availability, and equipment capacity. These engines autonomously deliver an optimized work plan with detailed tasks, such as pick lists, that will support on-time, in-full deliveries.

Orchestration engines also leverage ML, digitized warehouse maps, travel paths, and labor standards to fine-tune the effort for each

work item. The work plan can be adjusted for incidental anomalies, such as a missed incoming delivery or an equipment breakdown. Via dynamic resource adjustment, the engines can autonomously update the plan in a way that optimizes the balance between customer service and financial impacts.

DHL Supply Chain partnered with Blue Yonder on an implementation of robotics and automation at 2000 worldwide sites, linking these capabilities directly to the Blue Yonder warehouse management system at each facility.



IoT and telematics

Leveraging real-time data for increased visibility and responsiveness

Today, IoT and telematics technologies are providing a critical competency for logistics teams by gathering real-time data from across the supply and distribution network, as well as from third-party sources such as news and weather. These insights help flag disruptions at a very early stage, improving agility.

In the warehouse, IoT devices support inventory and task monitoring; route optimization for humans, robots, and forklifts; and the inbound and outbound timing and handling of materials. In the age of pandemics, they can also monitor employee health and enforce safe practices such as social distancing.

In the transportation function, advanced detection and monitoring technologies can report on real-time conditions inside trucks and containers, increasing item visibility across the entire supply chain and ensuring product quality. When location monitoring is paired with advanced algorithms and AI, truck routes can be optimized in real-time based on traffic conditions, fuel costs, emissions, customer delivery expectations, and other decision factors.

IoT devices also contribute to advanced predictive maintenance, to maximize the uptime of the entire fleet. Telematics – which encompasses telecommunications, instrumentation, and vehicular technologies – also contributes to cost-effective and efficient fleet management, tracking, and navigation.

Looking ahead, digital twins are an emerging reality for logistics operations. By gathering operations-based IoT data, companies can simulate the real-time and future conditions of the fleet or warehouse by virtually modeling processes, objects, and locations. As conditions change, these digital twins enable the creation of what-if scenarios so planners can accurately predict outcomes before making critical decisions.

62%
of companies are currently investing in the automation of their logistics facilities.¹

¹ According to a 2020 survey of supply chain professionals conducted by Reuters and Blue Yonder <https://blueyonder.com/knowledge-center/collateral/reuters-efl-global-logistics-report>



Autonomous vehicles

Improving safety, while optimizing both customer service and costs

Driverless trucks, forklifts, drones, and other vehicles are poised to transform the logistics function. These automated vehicles increase safety by eliminating human errors, and they also increase speed and efficiency – leading to optimal service and cost outcomes.

Not only does the cost of human drivers represent a major expense for logistics organizations, but many countries are experiencing driver shortages that interfere with companies' ability to serve customer needs. Autonomous vehicles address both these challenges. As the recent pandemic has revealed, any opportunity to eliminate humans from the service equation improves delivery confidence, operational consistency, and health outcomes.

Via autonomous vehicles, transit time is greatly decreased, which in turn reduces the need to place inventory close to customers as companies struggle to match supply with volatile demand. Last-mile delivery vehicles that operate autonomously can help meet customer expectations for speedy, low-cost delivery. Light cargo delivery drones show enormous promise for transporting small

packages such as medications and food.

Driverless forklifts are already widely available, along with other warehouse automation and robotics technologies. While many areas of the world project a slow adoption of driverless cars and trucks on the highway, some Asian countries – which have realized higher growth rates for ecommerce and a greater adoption rate of new logistics technologies – may see the deployment of autonomous truck fleets by 2024, although government regulations will ultimately dictate the pace of rollout.

Amazon, Google, and UPS have completed successful tests of drone delivery systems, signaling that this technology will soon be within reach of the world's logistics teams.



Collaboration and connectivity

Enabling all trading partners to see, and manage, shared disruptions

Product, labor, and transportation capacity shortages gained worldwide attention during the COVID-19 pandemic. As market volatility continues, these and other sources of disruption aren't going away. Retailers, manufacturers, and third-party logistics providers can minimize the impact of these disruptions, and stabilize their results, by increasing their digital connectivity with partner organizations.

By revealing what's happening in real-time, across every node of the supply and distribution network, advanced digital solutions are key in increasing companies' agility and resilience when the unexpected occurs. Blind spots, caused when trading partners are unable to see key information such as product location or available-to-promise inventory, are eliminated.

The obvious need to share visibility is steering logistics teams toward commercial networks and platform business models. New collaboration platforms help logistics teams procure freight capacity, labor resources, warehouse space, and services – accessing a much broader spectrum of suppliers to ensure service continuity and cost control. New freight, labor, and

fulfillment marketplaces allow companies to operate more flexibly and nimbly, instead of relying on capital- and time-intensive investments like fleet or warehouse expansions.

Enabled by AI, today's new level of collaboration and connectivity creates a shared focus on maintaining seamless product flow across all nodes. Real-time analytics ensure that activities such as the unloading of trailers, the cross-docking of trucks, and the allocation of products are prioritized strategically. In addition, AI and data science can reveal the impacts of each decision on every other customer order, creating an environment where all events are unique, yet connected via a digital thread.

Blue Yonder's dynamic price discovery platform creates a marketplace environment in which companies can access freight capacity and rates from multiple providers in real-time.



Intelligent problem-solving.

Exceeding human cognition by analyzing data and acting in real-time

As the amount of logistics data grows – from internal devices and sensors, partner organizations, and third-party sources – human cognition simply can't keep up. Advanced problem-solving technologies, such as AI and ML, are continuously evolving in their ability to analyze large volumes of real-time data, detect and analyze exceptions, propose resolutions, and act autonomously and immediately to resolve problems.

Intelligent optimization engines, powered by AI and predictive analytics, act as a strategic response lever. As soon as a major disruption is sensed – whether in the logistics planning phase or when inventory is already in transit – these powerful decision engines are already weighing the options. As they gather real-time data and apply advanced analytics, they're able to define failure risks and assess the potential outcomes of various intervention strategies.

Then, before logistics performance is significantly impacted, these optimization engines rapidly choose and implement an autonomous response that can be iteratively re-planned as conditions evolve.

For example, Blue Yonder's Transportation Management System (TMS) Cognitive

Planning Assistant offers ML capabilities that enable near-term forecasting, failure risk prediction and what-if scenario generation. Luminate Logistics and Luminate Control Tower enable companies to track shipments between supply chain nodes, predict far in advance when a shipment will be delayed or when a warehouse is out of capacity, and autonomously intercede.

Machine-learning capabilities mean that, over time, the optimization's systems get smarter and smarter about disruption signals, potential responses, and their impacts across the logistics network. This drives more consistent results that balance customer service objectives with positive financial outcomes.

SuperFrio, a leader in refrigerated logistics, partnered with Blue Yonder to achieve a 99.95% picking accuracy rate by replacing manual work and human errors with automation and artificial intelligence.



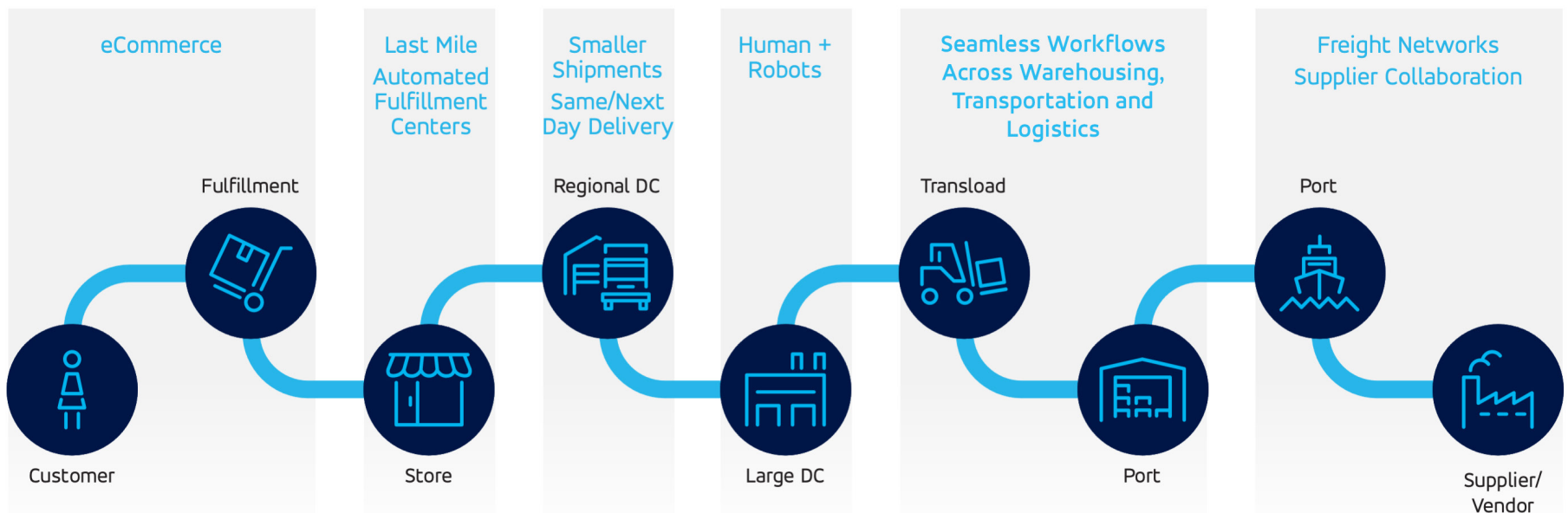
AUTOMATION

Establishing a culture of agility via Unified Logistics

Blue Yonder has created a unique concept called “Unified Logistics” to describe how companies can leverage these five advanced technology areas to digitize their logistics operations for increased agility.

Enabled by Blue Yonder’s Unified Logistics, your logistics team’s day-in-the-life could look like this:

- Collaboration is **digital and automated** for the entire distribution network.
- Functional managers leverage AI engines to **autonomously manage operations**.
- Humans and machines work together in **nimble and fluid ways** to orchestrate resources.
- IoT and data science enable **fact-based, optimal decisions**, resulting in faster deliveries, profitably.
- Each customer order is **singular, yet connected** with every other order.
- **Seamless workflows** across functions and partners are enabled by digital connectivity.



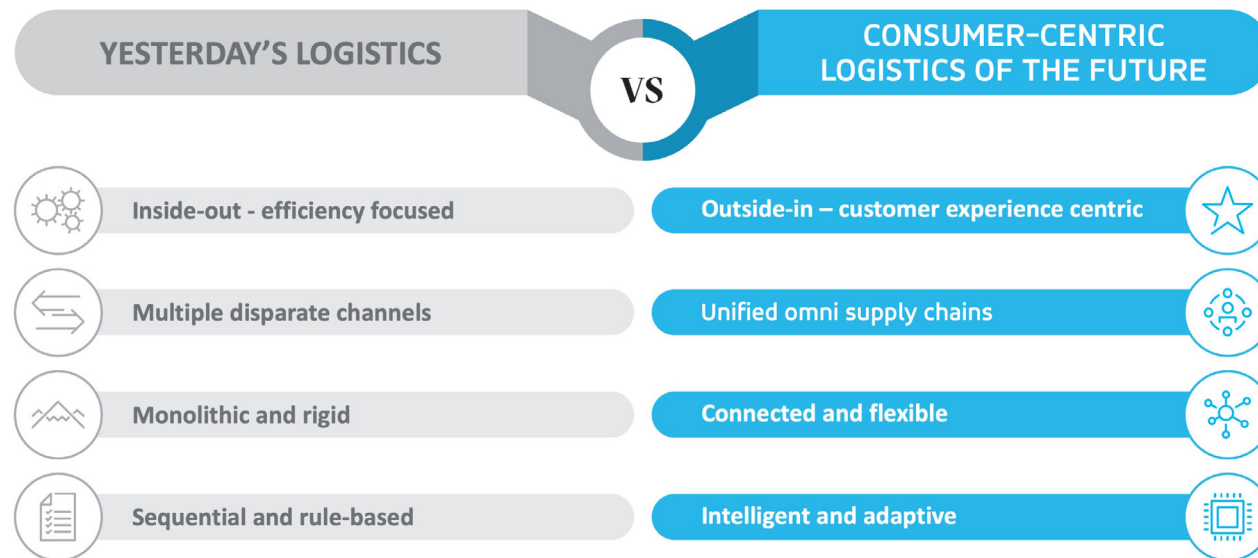
Envision a more agile future with Blue Yonder

By applying Unified Logistics solutions and best practices from Blue Yonder, logistics teams can profitably plan and optimize their inventory, space, people, processes, physical assets, and other resources. No matter how volatile or disruptive the business environment, they can move ahead decisively with the speed and agility required in the post-pandemic world.

Success today requires agility. That means companies need to shed their traditional,

siloes thinking and embrace a holistic, customer-centric view. Organizations need to take command and control of their product flow through all supply and fulfillment channels, breaking down functional walls and partnership barriers that impede a larger view. Finally, they need to embrace the rapidly expanding technology ecosystem to fully leverage the benefits of an open platform for ongoing logistics speed and innovation.

Unified Logistics



To learn more about Blue Yonder's Luminate Logistics solution portfolio, and the unique level of agility it can create for your business, visit <https://blueyonder.com/solutions/luminate-logistics>.



[Learn more about Unified Logistics](#)

blueyonder.com

Copyright © 2021, Blue Yonder Group, Inc. All rights reserved. Blue Yonder is a Registered Trademark of Blue Yonder Group, Inc. All other company and product names may be Trademarks, Registered Trademarks or Service Marks of the companies with which they are associated. Blue Yonder reserves the right at any time and without notice to change these materials or any of the functions, features or specifications of any of the software described herein. Blue Yonder shall have no warranty obligation with respect to these materials or the software described herein, except as approved in Blue Yonder's Software License Agreement with an authorized licensee.