



Transportation & Logistics: The Way Forward

As the pandemic's grip persists, we offer a roadmap for T&L companies seeking to forge a digital-first future.

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Cognizant[®]

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Source: <https://www.getconvey.com/blog-d-2020-post-holiday-survey/>

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Introduction

It's probably too strong to say the logo on the side of the truck is now more important than the logo on the side of the box. But it's certainly not overstating things to say that consumers demand fast, reliable, free (in many cases) shipping, with easily accessible updates. In one **2021 survey**, 47% of consumers said they would consider abandoning a retailer after a single bad shipping experience.

COVID-19 lockdowns, with consumers stuck at home and supply chains shattered, fundamentally shifted relationships in ways that remain even as the pandemic eases — and will live on when it is a distant memory. In an evolution that was already underway but was supercharged by COVID, manufacturers, retailers and consumers alike have come to value rapid, reliable transport with full transparency more than ever. This places both power and responsibility in the hands of the transport and logistics (T&L) industry.

That industry, like many others, is in the midst of a dramatic overhaul to digital-first. And because T&L companies range from multibillion-dollar global giants (which have long been modernizing their systems and data) to relatively small regional players very much in need of a digital kick-start, there is no one-size-fits-all solution. But as we noted in a **recent report**, there is no going back, no business as usual, for T&L companies. There are, rather, new opportunities, and only new paths to get there.

This ebook offers a snapshot of the T&L industry: top challenges, the pandemic's influence, and possible paths forward for businesses regardless of where they stand on the digital maturity scale.



The lay of the land

Within what we term the “megatrend” in T&L — the digitalization of the industry — are many other trends, challenges and opportunities. We believe that disruptions in rail transport, ports, and the overall industry that can be traced back to the pandemic will be felt for years. As is the case in many industries, evolutions that otherwise might have taken a decade were forced on T&L businesses almost overnight. Moreover, there is no rest for the weary, there are more disruptions to come. Companies must scale up their digital operations or be forced out.



Rail transport

Worker shortages
Inefficient loads



Ports

Backed-up
container ships

Insufficient
operating hours



Trucking

Driver shortages
Soaring fuel costs

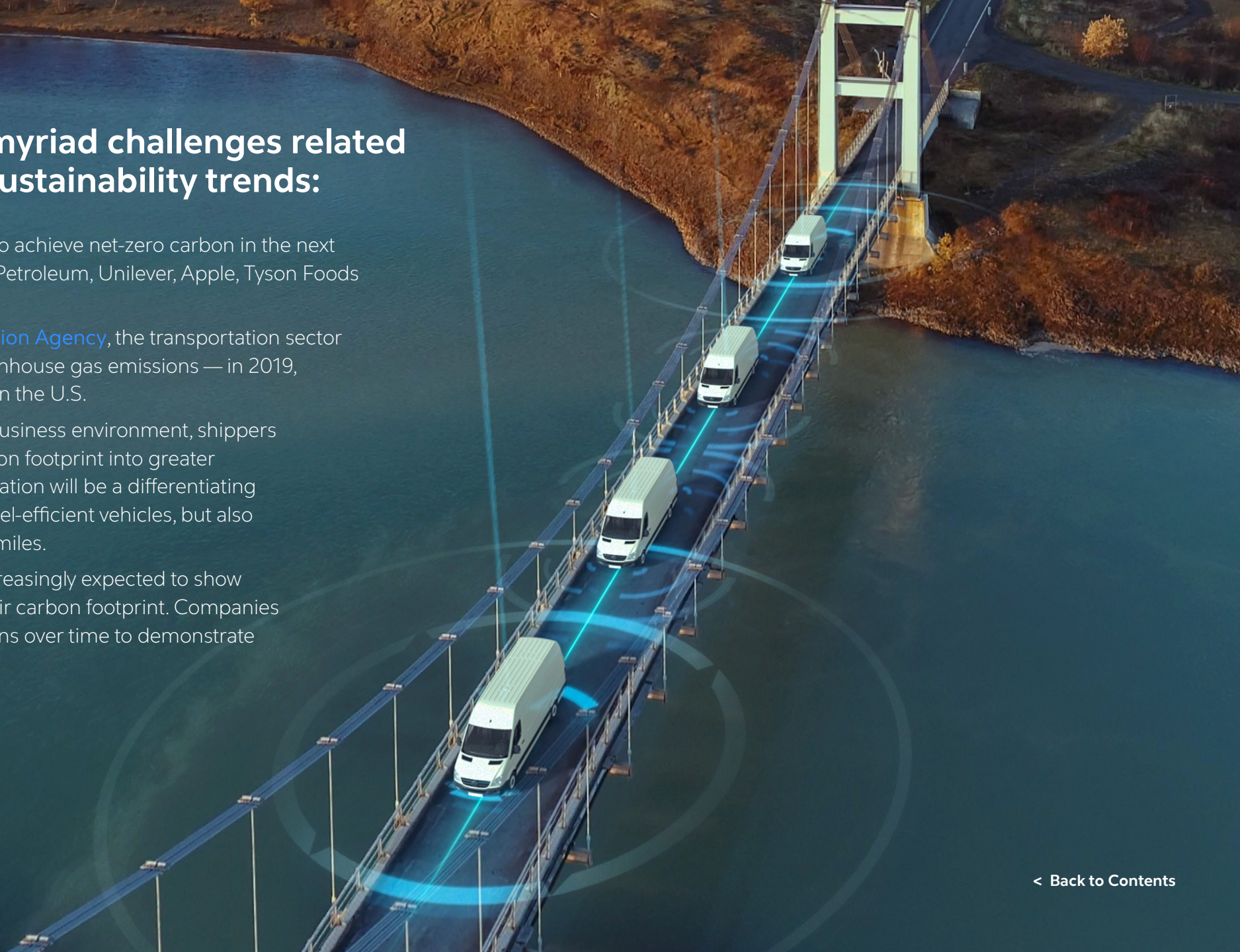
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Current landscape: trends, opportunities and challenges

- I Final-mile delivery enablement.** The sustained acceleration in e-commerce continues to catch shippers by surprise. In 2020, [nearly 20%](#) of U.S. retail sales were online purchases, and that percentage is [expected to hit 24%](#) in a few years.
- I “Asset light” growth model.** Asset light logistics and non-asset-based logistics companies, which enable companies to transition fixed costs to a variable-cost structure, can take greater advantage of return on assets, lower profit volatility, greater flexibility, and higher scale-driven cost savings than asset-heavy models.
- I Automation of commercial processes.** Logistics professionals and customs agents must make sense of the information contained in millions of documents in various formats, from bills of lading to customs declarations. Automation of this repetitive, labor-intensive processes across the T&L value chain will provide the ability to accommodate demand fluctuations more effectively, making organizations more agile and better able to grow.
- I Asset sharing.** Similar to Airbnb in the consumer space, asset sharing is increasingly utilized in B2B to take advantage of unused capacity. Pay-as-you-go trailer rentals such as [Convoy Go](#) and J.B. Hunt’s [360Box](#) are examples.
- I Digital freight marketplaces (DFMs) driving new business models.** In an attempt to integrate the untapped potential of owner operators and others, DFMs combine digital freight-matching tools and loyalty-and-reward programs that enable shippers and carriers to interact directly, bypassing traditional brokerages and posting or picking loads that meet each other’s criteria.
- I On-demand warehousing.** Along with on-demand fulfillment, on-demand warehousing has grown significantly, fueled by the global e-commerce boom and (primarily) smaller merchants looking for flexible warehousing and fulfillment options.
- I Investment in autonomous vehicles.** Driverless trucks, already used in unmanned, fully automated port and inland terminals, will change the cost structure and utilization of trucking — and, with that, the cost of consumer goods.

Additionally, T&L faces myriad challenges related to climate change and sustainability trends:

- [Hundreds of companies](#) have pledged to achieve net-zero carbon in the next few decades, including Amazon, British Petroleum, Unilever, Apple, Tyson Foods and Nestlé.
- According to the [Environmental Protection Agency](#), the transportation sector is one of the largest contributors to greenhouse gas emissions — in 2019, it accounted for 29% of such emissions in the U.S.
- We believe that in the coming greener business environment, shippers will take a transportation provider's carbon footprint into greater consideration. Energy-efficient transportation will be a differentiating factor. This will demand not only more fuel-efficient vehicles, but also more efficient routing and fewer empty miles.
- Transportation service providers are increasingly expected to show they're taking steps toward reducing their carbon footprint. Companies will have to effectively track their emissions over time to demonstrate progress.

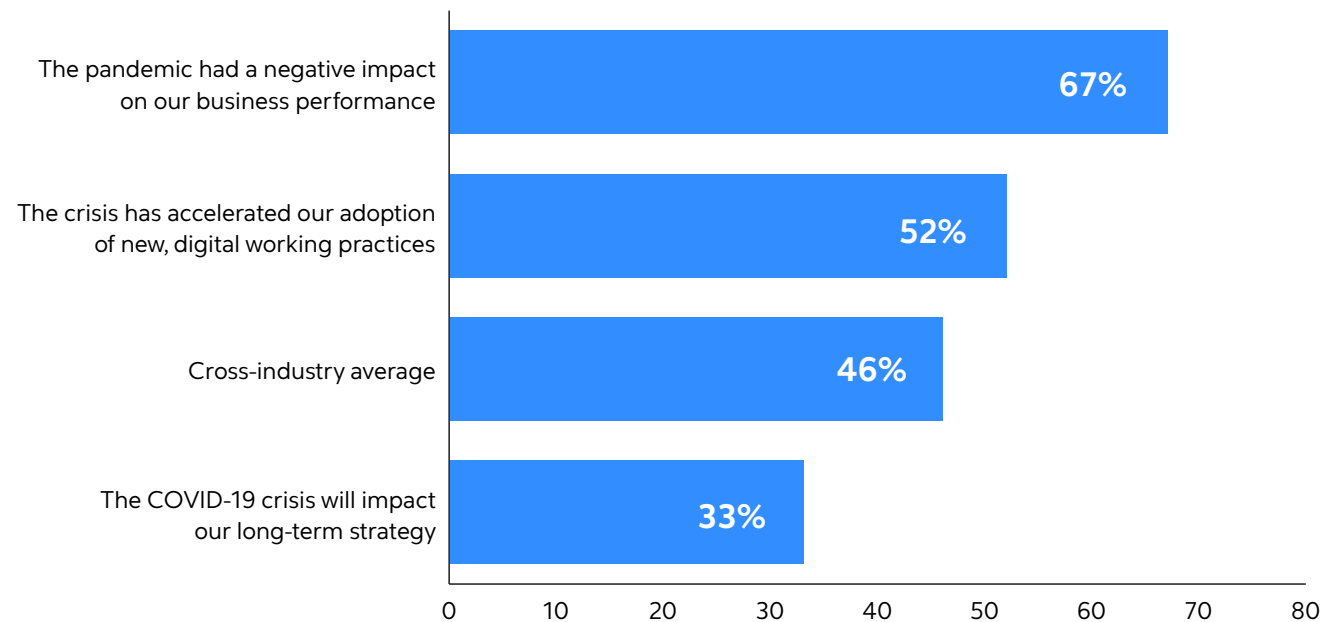


The pandemic's influence

The digitization movement precedes the pandemic. But T&L was hit hard by the global health crisis, our research finds:

In T&L, COVID drives change

T&L executives' "Yes" responses to survey questions



Source: A 2020 Cognizant survey of 4,000 global executives, including 278 from the T&L industry



The following illustrates the pandemic's impacts, along with some measures to combat those impacts.

Impacts and interventions

Commercial impacts



Extreme fluctuations in capacity. For example, imports from Asia rose 32.4% year over year in the first half of 2021, before the Delta variant brought still more uncertainty. COVID has made predicting demand much more difficult, and the bullwhip effects will be felt across supply chain networks well into 2022 and beyond



Exceptionally high demand drove up spot rates in some lanes, often based on panic capacity buying by shippers



Food service distribution, automotive and retail were especially hard hit; job losses and sometimes bankruptcy resulted



Variable pricing to COVID hotspots with alternate service-level agreements



Industries deemed “essential” (including groceries, refrigerated goods, medicines and many others) saw increased demand, resulting in a capacity crunch



Business closures and job loss due to the varied impact on Transportation Service Providers (TSPs) based on the industries being serviced



Distribution channels were reorganized to primarily maintain stock in distribution centers near high-demand areas

Operational impacts



There was a shortage of both drivers and warehouse workers caused by health concerns and increased competition for employees across sectors



Ports reached record-breaking levels of congestion. The Biden administration moved to operate Los Angeles ports 24/7 in response—but this is unlikely to alleviate congestion, as containers cannot be picked up due to jams in other parts of the supply chain



There was a notable increase in driver detention at ports, truck stops and transit hubs. This increase affected not only transportation costs but transit time and ETA predictions



Railroad terminals, like ports, are backed up; we expect intermodal congestion to persist throughout the year

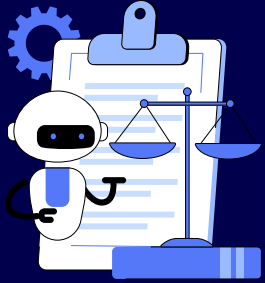


Last-mile delivery was impacted by a shortage caused by the spike in demand for food, drugs and masks



Short-staffed warehouses and distribution centers are struggling to handle the volume of inbound cargo. This leaves chassis tied up and out of circulation (chassis are needed to unload containers from ships and transport them from ports)

Interventions & corrections



Regulatory initiatives, such as **FMCSA** relaxations around hours of service and CDA licensing regulations in order to address available driving time



Alternate modes of transport, as when canceled passenger flights were converted to cargo flights



New business models and solutions, such as offerings by T&L providers to support the distribution of masks, medicines and vaccines

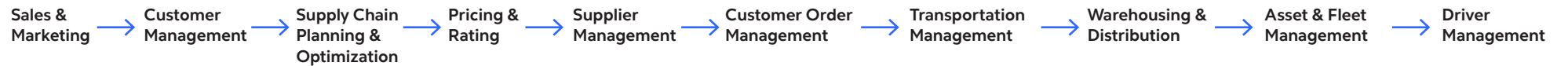


Technology remediation includes fast-track adoption of contactless interfaces for a variety of activities, including electronic bills of lading; payments; virtual communication and online collaboration tools; and online driver onboarding and training

What's next: Data, interconnectivity drive industry change

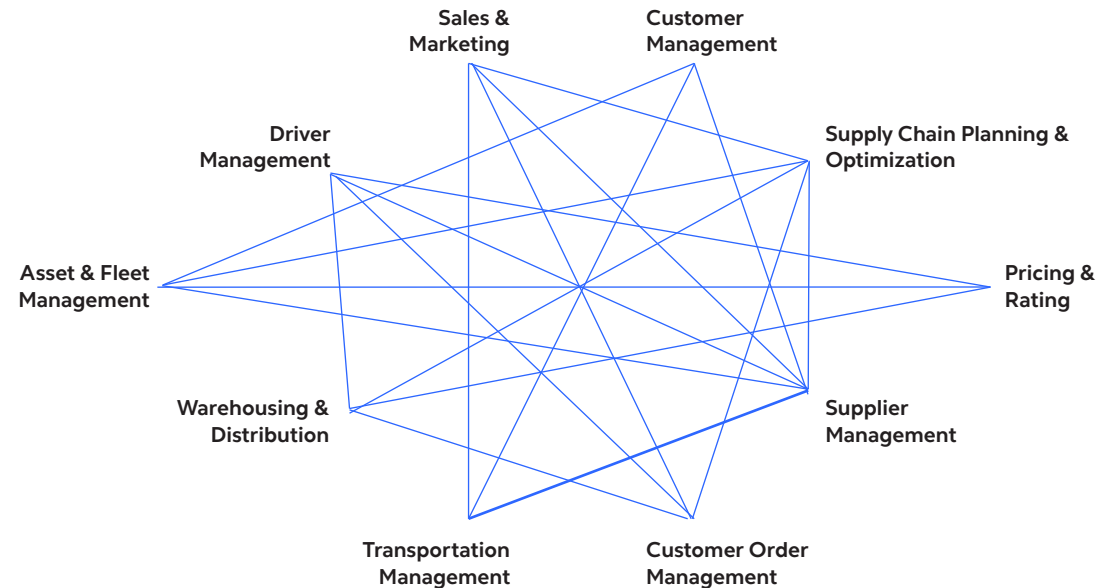
As T&L works toward the digital-first future, the increasing use of data (fueled by the implementation of artificial intelligence, machine learning and automation) signals major changes for companies and workers alike. The familiar value chain, which has traditionally featured one-way data flow, will become more interconnected, with fewer “flat” handoffs and a new focus on omnichannel data delivery.

The evolving T&L value chain



Current value chain

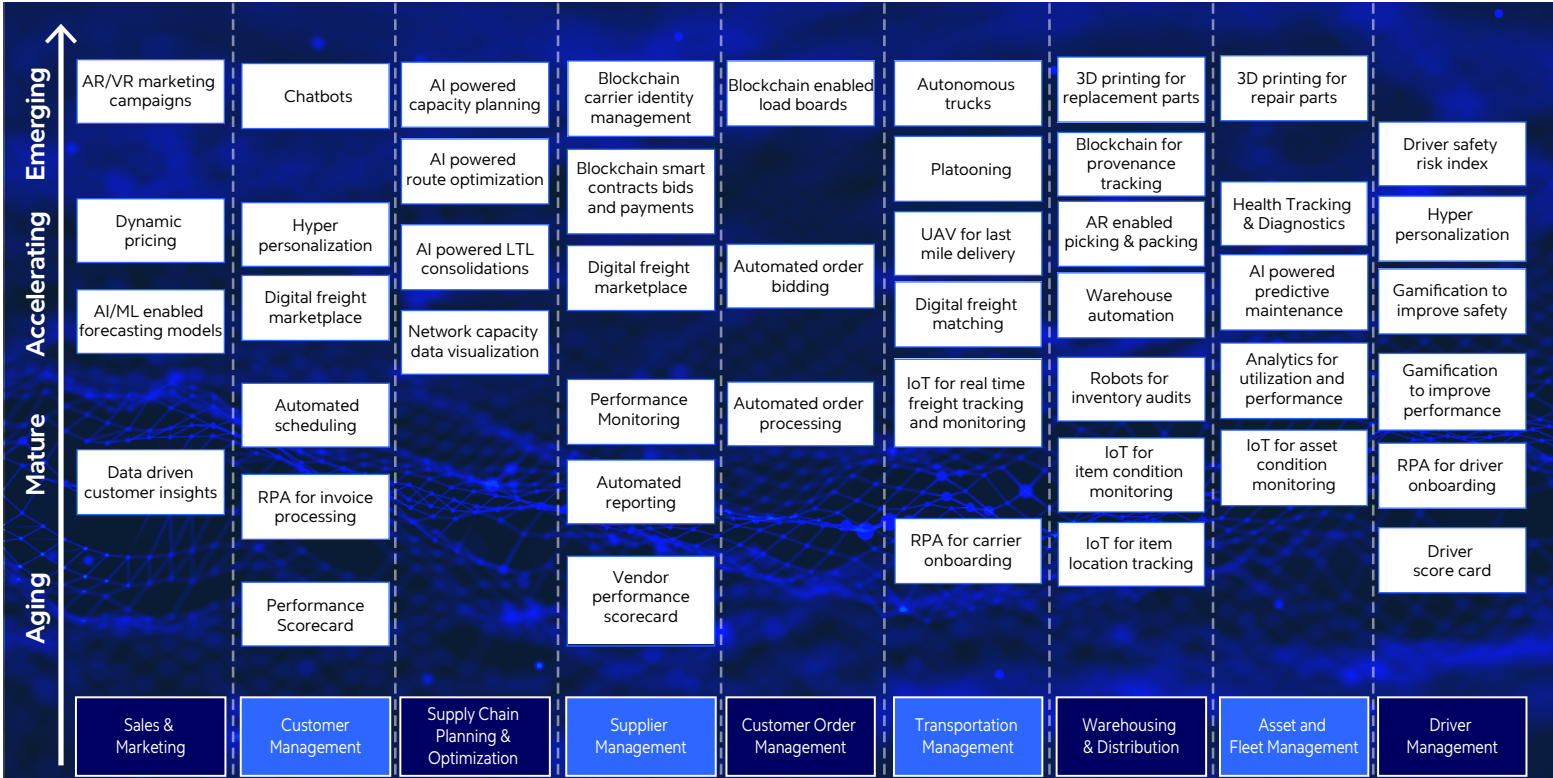
Future value chain



Getting from here to there

Unlocking data to achieve “T&L 4.0” is already underway in some industry-leading enterprises, as revealed on pages 15-18. Others, though, have a long way to go. This is due to the industry’s large spread in digital maturity. The following maps the capabilities T&L companies must master to the industry value chain, and notes the technologies required to implement those capabilities.

Industry 4.0-aligned T&L value chain capability map

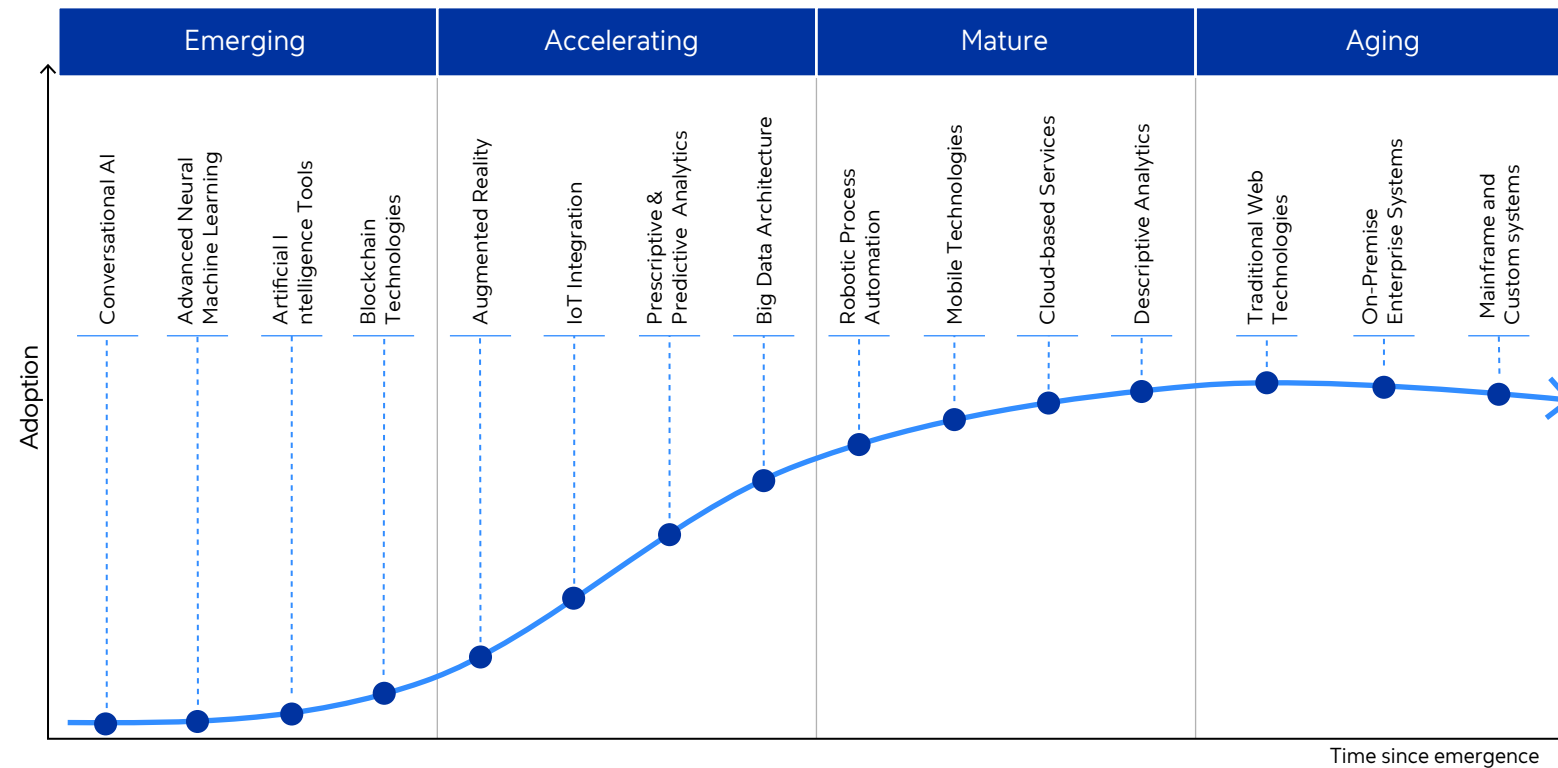


Source: Cognizant

Setting priorities

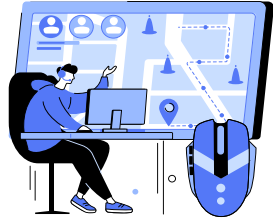




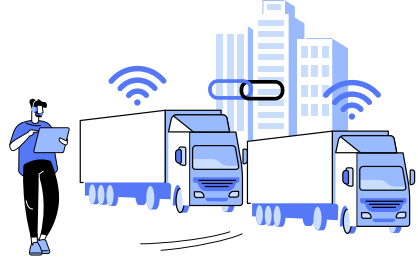



Depending on where they sit on the digital maturity curve, T&L business leaders may be overwhelmed by the steps required to remain competitive in the digital-first future. When working with clients in the decision-making process, we refer to the adoption cycle for various needed technologies, and a matrix mapping necessity (the must-haves vs. the nice-to-haves) against time required for implementation.

Adoption cycle for different technologies



Source: Cognizant

Phased implementation – business value vs. time to market

	Short Term	Near Term	Long Term
Beneficial	<p>Gamification to improve driver safety and performance</p> 	<p>UAV for last mile delivery</p> 	<p>Blockchain identity management, smart contracts, provenance tracking, load boards 3D printed parts</p> 
Essential	<p>Automated reporting Automated appointment scheduling Data visualization</p> 	<p>Conversational AI (chatbots) AI powered forecasting, route optimization, capacity planning, LTL consolidations AR powered picking and packing</p> 	<p>Platooning</p> 
Critical	<p>Freight tracking Predictive maintenance Exceptions management Warehouse automation Data driven customer insights Performance monitoring and score card IoT for item location and condition monitoring Equipment condition monitoring and health diagnostics</p> 	<p>Digital marketplace Digital freight matching Hyper personalization Dynamic pricing Robotic process automation</p> 	<p>Autonomous trucks</p> 

Case in point: Digital freight matching

Matching demand and supply of available transportation capacity has traditionally been an inefficient process dependent on tribal knowledge possessed by load planners. One of our clients, a top North American freight broker, found itself frustrated by this manual, labor-intensive process, which required practitioners to spend a great deal of time reviewing and analyzing market needs and capacity. The client knew its failure to capture market opportunities efficiently resulted in lost business and suboptimal freight margins.



Our approach

Digital freight matching modernizes the process, leveraging technology to efficiently match available demand (orders) to the most suitable supply (carriers) based on shipping needs, capabilities, performance, and other factors.

Solution

Machine learning (ML) models were created to find the best suited carriers for loads and vice versa. These models were based on myriad variables, including:

- Carrier characteristics such as capacity, geographic availability, endorsements, previous service performance, safety scores, preferences
- Load characteristics such as origin, destination, rates, hazmat classifications, temperature requirements, customs requirements, commodity type, value of the load, terrain of the lane, and service level of the load

Benefits

Shippers lack visibility into the very fragmented trucking market and rely on brokers to find capacity. Digital freight matching increases visibility and accessibility into the market-available capacity, improving the efficiency in how carriers and shippers find each other.

This reduces the time required for the transacting parties to look for one another and to negotiate rates and conditions. Transportation needs are thus met more quickly and more often, and carrier assets are utilized more efficiently.

During this time of supply chain disruptions and congestion — which, as noted, we expect to continue beyond 2022 — this speed and efficiency is a particularly salient key value driver for freight brokers.

In sum, this client achieved:

- Improved efficiency in matching demand and supply
- Automation of a formerly labor-intensive, tribal-knowledge-dependent process
- Human-in-the-loop implementation of automation technologies improves productivity and resource utilization
- Improved visibility on market intelligence across carrier networks and freight markets
- Greater capacity utilization and prediction
- Reduced waste from unnecessary empty miles caused by poorly matched freight

Case in point: Dynamic pricing

With more than 25% of the North American for-hire truck load market under non-contracted rates growing at 7% to 8% per year, combined with the increased adoption of digital brokerages and marketplaces in an extremely price-volatile, capacity-crunched, post-pandemic freight market, the ability to provide optimal pricing for available capacity (supply) has become a critical success factor for transportation companies.



Our approach

Dynamic pricing leverages digital technology to efficiently price lanes and freight moves based on current and predicted supply and demand as well as real-time information such as time of day, road congestion, speed, occupancy, and even carbon emissions.

Solution

An ML model was built to provide real-time pricing for the spot market by monitoring real-time transportation market supply and demand while also factoring in fuel prices, macroeconomic factors, and projected supply and demand based on seasonality, time of day, day of week, and geography.

Benefits

- Dynamic pricing cuts down the time to negotiate rates by providing the most accurate real-time prices for transportation services based on data about supply, historical demands, and market conditions.
- This improves load bookings; enables real-time pricing based on current market demand; increases sales and revenue per mile/load; and optimizes utilization of available capacity
- The shift to digital also brings new insights into customers' buying behavior, allowing T&L companies to capture previously unimagined market opportunities

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Dr. Gautam Sardar is AVP and Consulting Leader for Manufacturing and Logistics at Cognizant.

Gautam's experience spans various transformational areas in the manufacturing and logistics value chain, such as supply chains, Industry 4.0, data monetization, transportation management, and aftermarket. He has led multiple digital transformation exercises across domains such as industrial manufacturing, transportation, automotive, CPG and different functional areas within. Gautam's core expertise lies in decision sciences, helping him to bring the unique combination of process-driven, human-centric, and data-enabled approaches to transformation enabled by digital interventions with data being the centerpiece of the story. Over 20+ years in industry, Gautam has led multiple R&D, innovation, and consulting teams. He holds a PhD in Decision Sciences and has authored more than 25 research publications. Gautam has also been granted two U.S. patents for his work in decision sciences. He can be reached at Gautam.Sadar@Cognizant.com.



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About Cognizant

Cognizant (Nasdaq-100: CTSH) engineers modern businesses. We help our clients modernize technology, reimagine processes and transform experiences so they can stay ahead in our fast-changing world. Together, we're improving everyday life. See how at www.cognizant.com or [@Cognizant](#).



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