

**Disruption.
Digitalization.
Disintermediation.**

Transportation and logistics
in the coming decade



EY

Building a better
working world



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Navigating digitalization and disruption: do you change your business or the way you work?

1. Foreword

This point of view is the first in a series of publications outlining critical issues and opportunities that can help your organization ride the wave of change impacting the global Transportation and Logistics (T&L) industry.

Here is a summary of our key observations:

- ▶ As the pace of change is accelerating in all fields, Transportation and Logistics companies are challenged not only by their traditional competitors, but also by new entrants looking to disrupt the industry.
- ▶ It is evident that technology is one of the prime drivers of change in the transportation industry, impacting everything from last-mile delivery to warehouse management. From data analytics and blockchain to drones, the Internet of Things (IoT) and autonomous vehicles – the way goods are moved is changing dramatically.
- ▶ The need to physically move goods is certain not to go away anytime soon; however, the challenge is how you deliver returns in an ecosystem where innovation in services is set to generate more value than the transportation itself.
- ▶ While volatility is here to stay, its pace is accelerating due to the interconnectedness and interdependency of the global networks. Navigating uncertainties and taking appropriate risk mitigation measures must become fundamental parts of a T&L company's value proposition.

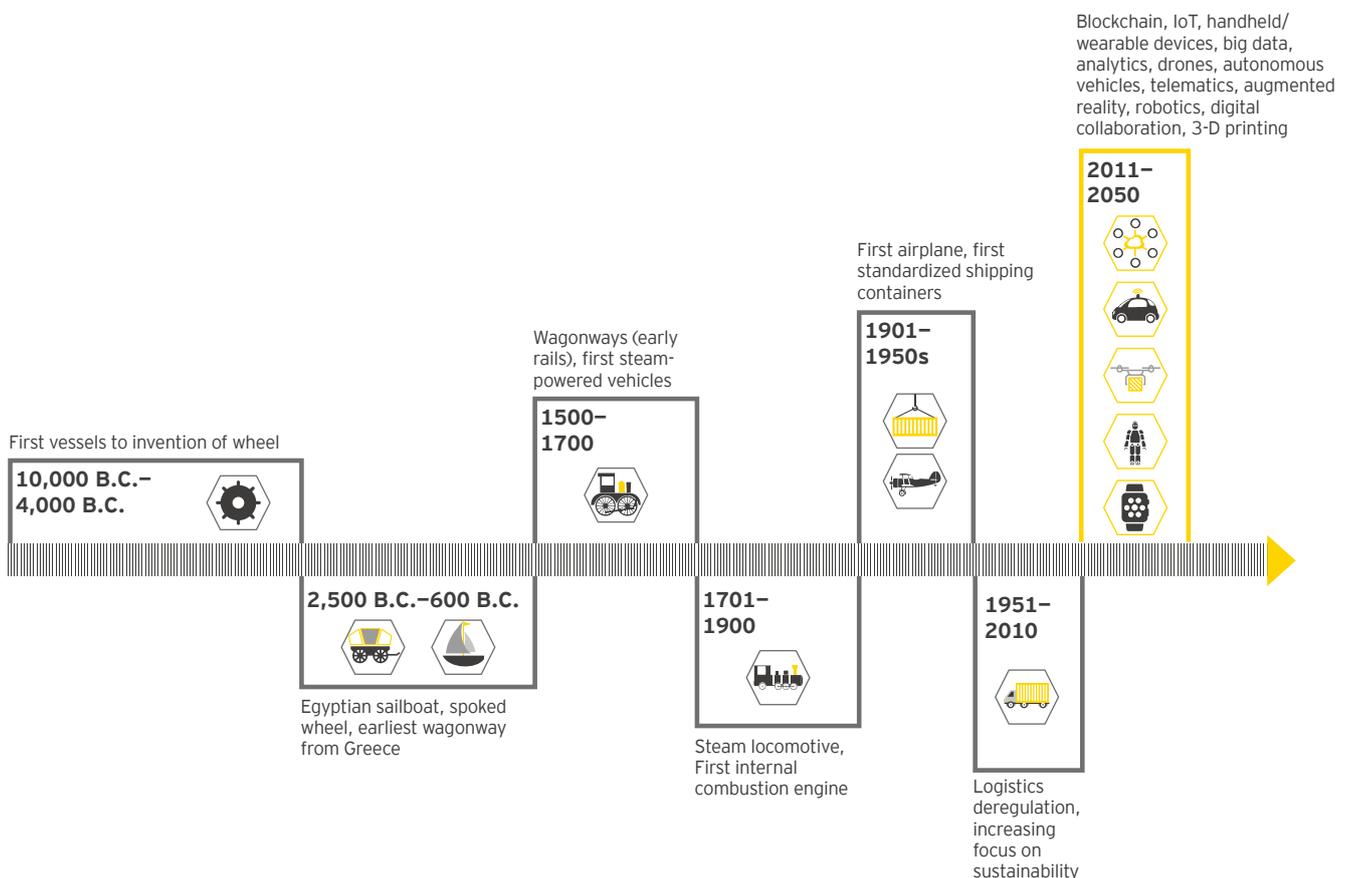
We hope you find the ideas and topics in this document thought-provoking and worthy of discussion at all levels of your organization.



Randall Miller
EY Global Automotive & Transportation Sector Leader



Kevin R. Custis
Principal, Sr. Leader Transportation Sector Executive Team



2. Executive summary: digitalization and disruption

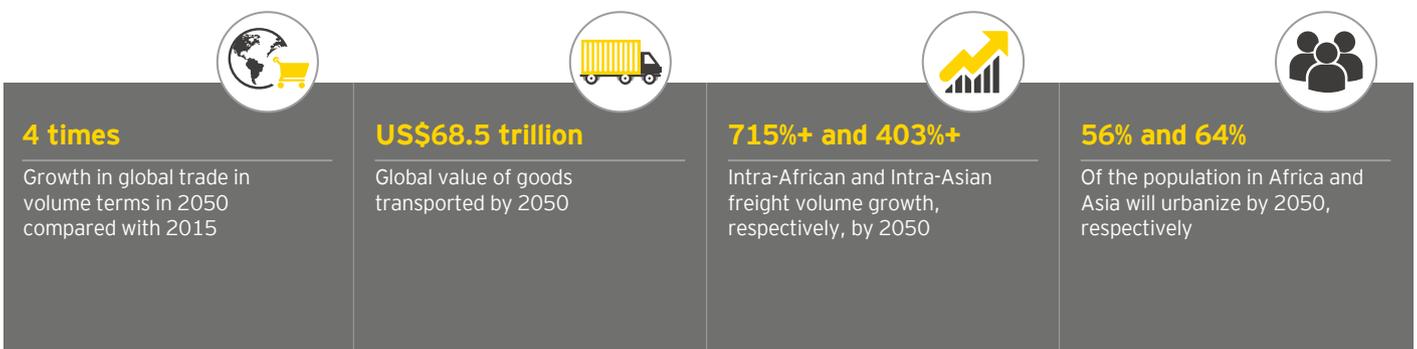
The transportation and logistics industry is facing a fundamental transformation. Following centuries-long mechanical and product innovations, technology innovation and digitalization is disrupting almost every process across the ecosystem – from the methods of shipment, content and cargo management to the supporting administration activities including documentation and payments.

As global population will increase from 7.4 billion to 10.6 billion by 2050, the volume of goods shipped will quadruple by 2050, driven by urbanization (6.4 billion are going to live in cities), increase of disposable income, internet penetration and ease of access to new technologies. The current document/paper-based shipments are expected to reduce significantly as digital document management evolves.

Given the accelerating pace of change, T&L companies need to transform themselves for a world where they are no longer protected by entry barriers, competition comes from all directions, and digitalization will become the major agent of change.

We have identified six industry-specific change drivers that will impact the T&L industry over the next decade:

- ▶ **Global uncertainty:** disruption in the global supply chain cost US\$56 billion in 2015 in Europe alone. Economic turbulence, protectionism and geopolitical instability are forcing transportation and logistics providers to adopt new business models and new alliances.
- ▶ **Urbanization:** with the rise of megacities, T&L providers need to cope with the challenges of urban logistics, including congestion, difficulties in loading and unloading, and last-mile delivery.
- ▶ **Digitalization:** digital technologies will transform the industry, with new efficiencies and new visibility. However, technology is a double-edged sword that also creates rising customer expectations and security challenges.
- ▶ **Technology innovation:** business model disruption is coming from established companies and a host of new entrants who are harnessing the latest technology innovations. This will lead to horizontal and vertical integration across the value chain and networks that are real-time optimized.
- ▶ **Need for new talent:** new technologies require new skill sets – including design thinking, data sciences and robotics. Hiring costs will rise, and innovation will be a key competitive factor.
- ▶ **Sustainability and transparency:** stakeholders, government agencies and consumers are keenly interested in the practices that guide T&L companies, including sustainability, labor conditions and environmental compliance.



Sources: UN – World Urbanization Prospects; World Economic Forum; International Transportation Forum; HSBC Trade Flows Report

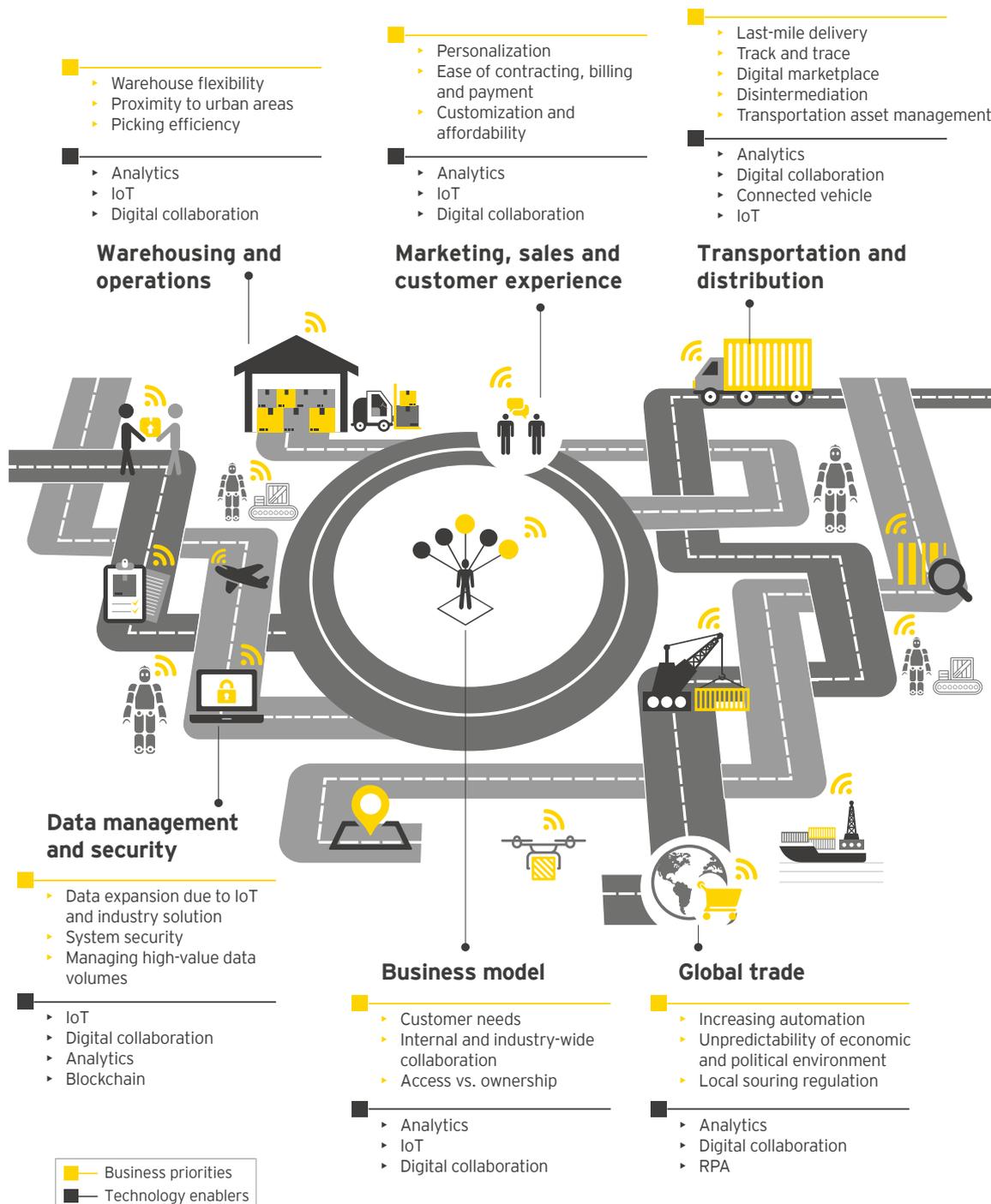
The T&L industry ecosystem

We have identified the following key issues and technologies influencing the T&L ecosystem components listed in the order of priority. Chapter 4 provides additional detail.

We believe that companies will need to embrace innovation and encourage new ideas. They should fail fast and fail often. They also need to respond with agility and take advantage of regulatory changes. Companies need to prepare for technologies in three waves:

- ▶ **Wave 1:** exploit the opportunities provided by technologies that are past the tipping point, such as analytics, digital collaboration, the Internet of Things and robotic process automation (RPA)
- ▶ **Wave 2:** swiftly embrace emerging technologies such as blockchain, connected vehicles and drones as these will disrupt the industry within the next five years
- ▶ **Wave 3:** prepare for technology disruption of deep learning, augmented/virtual reality and 3-D printing

While some might consider this a farfetched comparison, we can also expect that evolution would further the sophistication of the network and eventually transportation could function similarly to the circulation of cells in the bloodstream within the next 50 years.



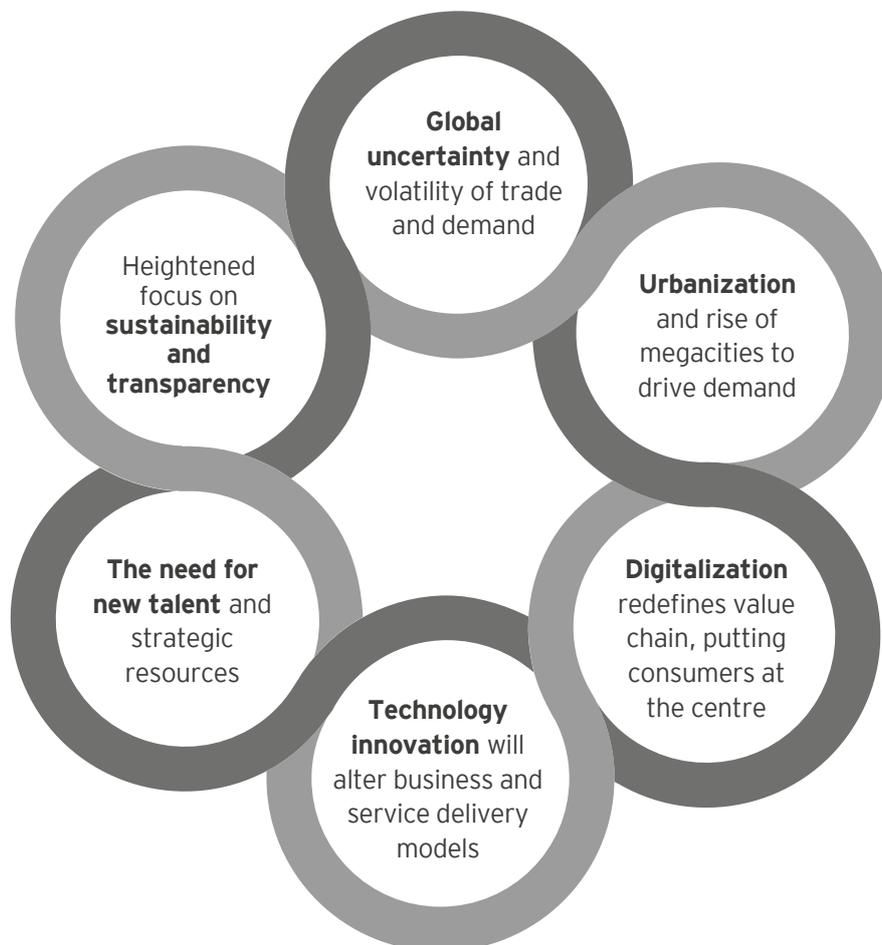
3. Sector trends driving changes over next decade

Three primary forces are behind the current wave of disruption: technology, globalization and demographic change. By understanding the interaction between these forces, EY identified eight global megatrends that are shaping the future. These are large, transformative trends that define the present and shape the future by their impact on businesses, economies, industries, societies and individual lives.

These are:¹

- ▶ **Industry redefined:** is every industry now your industry?
- ▶ **The future of smart:** what intelligence will we need to create a smart future?
- ▶ **The future of work:** when machines become workers, what is the human role?
- ▶ **Behavioral revolution:** how will individual behavior impact our collective future?
- ▶ **Empowered customer:** how will you change buyers into stakeholders?
- ▶ **Urban world:** in a fast-changing world, can cities be built with long-term perspective?
- ▶ **Health reimagined:** with growing health needs, is digital the best medicine?
- ▶ **Resourceful planet:** can innovation make the planet resource rich instead of resource scarce?

These megatrends are catalyzing six drivers of change in the T&L industry over the next decade:



¹ *The upside of disruption: megatrends shaping 2016 and beyond, EYGM Limited, 2017.*



3.1 Global uncertainty and volatility of trade and demand

For decades, the T&L industry has thrived on globalization and the elimination of trade barriers. However, its very ubiquity now leaves the industry vulnerable to the slightest tremors in the geopolitical and economic landscape.

For instance, political uncertainty can disrupt local supply lines. And changes in trade agreements such as NAFTA and the EU/Brexit split can make cross-border trade more costly.



Geopolitical instability has unpredictable consequences

The T&L industry also faces geopolitical instability in both developed and developing markets – including the uncertainty of Brexit, potential trade protections in the US, fluctuating fuel prices and exchange rates, and economic downturns in Brazil, Russia, Ukraine, the Middle East and North Africa. In the 16th EY Global Capital Confidence Barometer, the majority of the transportation sector executives cited a broad range of geopolitical and emerging policy concerns as the greatest business risks to growth over the next year. The global supply chains and supporting infrastructure are also highly vulnerable to war and terrorism.

The T&L industry is now in a perpetual state of disruption as new entrants find innovative ways to intermediate and disintermediate. As we transition from an industrial to a digitized era, the future will belong to those who think and act as challengers. Incumbent T&L companies will need to take a hard look at the relevance of their core competencies, assets and offerings in this fast-evolving market.

Anil Valsan
EY Global Automotive & Transportation Lead Analyst

Changing global trade dynamics and uncertain operating environment is challenging logistics business

The global value chain is in a perpetual state of disruption. With economic turbulence, protectionism and intense competition, T&L companies must navigate uncertainties and take appropriate risk mitigation measures.

In some cases, this may entail alliances with local or global partners – some of whom may even be competitors. In other cases, it may involve the establishment of new entities that provide services that are specific to a local or regional market.



US\$56 billion

Rise in the global supply chain costs in 2015 due to disruptive events including terrorism, criminal activity, weather changes, etc.



3.7%

Growth in the world trade in 2017 up from 2.8% in 2016



3.4 connected devices/person

By 2020

Sources: British Standards Institute report; World Trade Organization; Cisco.



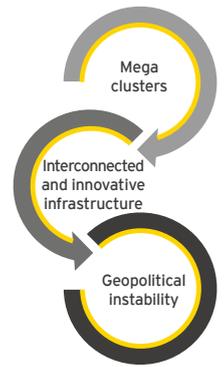
3.2 Urbanization and rise of megacities to drive demand

Growing urbanization, with congestion and significant demographic variations, brings with them unique challenges for the transportation and supply chain industry.

Evolving demand for urban logistics

People are already expecting just-in-time and often near-immediate delivery. This has led to increased parcel volume, exerting pressure on city infrastructure and sustainability. Urban logistics thus needs to deal with a multitude of challenges, including congestion, noise, emissions, safety, logistics bottlenecks, loading and unloading, parking, and vehicle overloading.

The changing demand pattern from consumers and businesses is redefining logistics and city infrastructure.



Interconnected infrastructure development

The design of end-to-end connected infrastructure, optimized for autonomous vehicles and robots, capable for multimodal and high-speed logistics, will need to take into account spatial restrictions, demographic variations, traffic limitations, environmental and sustainability concerns.

From automated machines to connected infrastructure, technology is transforming freight mobility. Innovative supply chain and distribution improvements are being adopted to create integrated urban hubs that leverage data, applications and technology. The result will be the efficient and cost-effective movement of goods.

Urban logistics is undergoing transformative changes affected by changing consumption and supply patterns exerting pressure on city infrastructure. This will lead to a shift in the transportation network design from hub and spoke to highly distributed "hub and hub" model complemented by a wide variety of last-mile collection and delivery options.

Brian D. Lynch

Logistics & Supply Chain Transaction Advisory Services, Ernst & Young LLP

"Glocalized" urban logistics solutions

As the transportation ecosystem evolves, traditional last-mile delivery solutions are being redesigned, influenced by local economic, environmental, political and regulatory, technological and consumer trends. The transportation industry is looking at measures ranging from land use regulations to crowdsourcing platforms.



41 megacities

(defined as population >10 m) by 2050, up from 23 currently.



20%

of retail to happen through online channels by 2025



15% of traffic

in urban regions constituted by freight in EU by 2050



~US\$28m

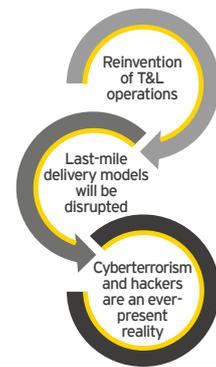
annual losses in truck operating costs and wasted fuel in US due to congestion and inefficient transportation system

Sources: World Economic Forum; European Road Transport Research Advisory Council; US Department of Transportation.



3.3 Digitalization redefines value chain, putting consumers at the center

Increasing volumes of data and sophistication of connectivity across the value chain are impacting the entire industry ecosystem. From exploring monetization opportunities at the consumer end of the value chain to transforming the workplace by applying robotics, the potential for harnessing the power of digitalization across the logistics industry is substantial. Unmanaged, this data threatens to overwhelm the industry's systems and processes. Managed, it can be a major source of competitive edge.



Transportation and logistics operations are being reinvented

From the industrial internet to 3-D printing and from analytics to blockchain and robotics, companies across the logistics ecosystem have an opportunity to leverage these diverse technologies to transform their businesses. Digitalization, therefore, will be the most critical trigger of innovation over the next few decades for the transportation and logistics industry.

Last-mile delivery models will be disrupted – e-commerce is raising customer expectations for more personalized experiences

Increasing connectivity is providing logistics companies with greater access to data from consumers as well as from the entire value chain. Furthermore, digitally enabled cross-border platforms are providing smaller companies with a global reach and enabling them to address growing customer demand for more personalized experiences. At the same time, digital solutions are empowering customers by providing them more personalized and flexible options.

And with start-ups disrupting last-mile delivery options, customer expectations are quickly rising. Autonomous trucks, robots, drones, crowd sharing and mobility aggregators will increasingly be the norm for city delivery.

Cyberterrorism and hackers are an ever-present reality

From the networks used for global communications, to the endpoint devices used to scan packages and containers, to the increasing use of Internet of Things technologies, T&L companies must maintain constant vigilance in their IT environments. And as recent events have shown, the vulnerability is often not within the enterprise itself but in its extended network of networks ranging from the tiers of suppliers to contractors and other business partners.

Disruptive digital technologies are accelerating the pace of change, with new entrants carving out their own position and altering the market dynamics. T&L companies must have a transformation strategy, have leadership alignment, and make the right investments to stay relevant in this new competitive landscape.

Jim Morton
US Logistics Practice Leader, Ernst & Young LLP



Between 2012 and 2014, e-commerce sales increased by about **102%**. During that same period, the number of online or e-commerce-type stores shot up by **1,354%**, with much of those changes being driven by consumer behavior.



25%
Of the transportation executives believe implementing and enabling a digital innovation culture is the most critical bottleneck in digital transformation



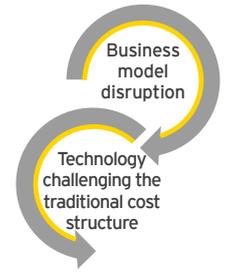
US\$1.5t**
Worth of logistics opportunity as a result of digital transformation by 2025

Sources: World Economic Forum; Cisco; EY analysis; 16th EY Global Capital Confidence Barometer.



3.4 Technology innovation will alter business and service delivery models

Rapid technological development is challenging the status quo of the T&L industry. Incumbents are being challenged as new entrants develop agile and innovative business and service delivery models that are capable of responding to an increasingly volatile global marketplace.



Business model disruption from new entrants and other industries ...

Robust technological platforms have opened up an ocean of opportunities, giving rise to a wave of start-ups and new entrants in the T&L industry. Mostly asset-light, these companies are leveraging technology to offer innovative solutions across the value chain – from virtual freight forwarding to last-mile delivery. Some of the companies are also tapping into the sharing economy and exploiting crowdsharing platforms to explore opportunities for new products and services. Technology developments are also improving the efficiency of sorting and warehousing operations.

Some collaborative developments in other industries are also transforming the T&L industry, unlocking new levels of safety, efficiency and quality. In addition, some existing customers are expanding their services across the logistics value chain, which not only complements their own business but also positions them as new entrants and major disruptors in the existing T&L ecosystem.

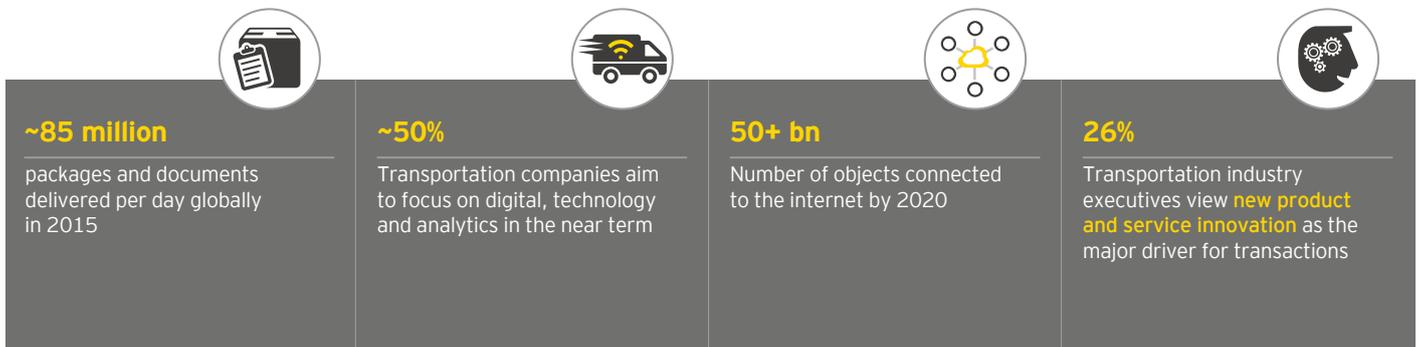
The technological developments challenging the traditional cost structure and value proposition ...

Rapid horizontal and vertical integration across the value chain is creating networks that are real-time optimized, enabling greater efficiency, transparency and agility. The processes of inbound logistics, sorting, warehousing, centralized management, sales and marketing, outbound logistics and other transportation services face being networked and automated, using technologies such as drones, blockchain, augmented reality, wearables and mobile.

The only companies to survive will be those that are well-networked and responsive to customer requirements. The industry will be seeking greater collaboration and opportunities to co-create innovative services and thereby deliver the most delightful customer experience.

Gyula Kangiszer
Innovation & Digital Strategy, Ernst & Young LLP

Also, logistics companies will need to develop deeper industry expertise beyond traditional transportation and logistics solutions. They will need to customize services and closely align themselves with their customers' operations, processes and technologies. Thus, service agility, responsiveness, customization, greater transparency and innovation will become key differentiators for a high-performing logistics company.

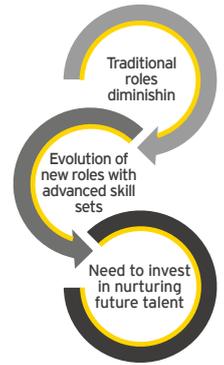


Sources: World Economic Forum; 16th EY Global Capital Confidence Barometer; Cisco.



3.5 The need for new talent and strategic resources

The changing dynamics of the T&L sector are changing the role of the existing workforce and creating demands for new kinds of roles and skills. However, the employment outlook in the logistics industry could be affected by geopolitical volatility and its associated threat to global travel and supply chains.



Changing nature of the industry leading to a demand for jobs with different skill sets ...

Automation of processes is leading to the creation of new skill requirements in the logistics, transportation and warehousing sectors from top management to the lower levels. In the past, C-level positions have operated in a relatively stable environment and have for decades been focused on traditional functions like operations, finance and IT, among others. With software becoming the principal driver of innovation, there is an urgent need for new management and leadership skills to meet the rapid innovation cycles and new industry dynamics.

This is giving rise to new roles including chief digital officer (CDO), chief privacy officer (CPO), chief strategy/sustainability officer (CSO), chief automation officer (CAO) and chief user experience officer (CXO). Similarly, at the lower levels, demand is rising for technology jobs like RFID consultant and data scientist/solution architect.

Automation and digitalization are challenging the security of some jobs while complementing some traditional jobs

Digitalization and automation are changing the landscape of the supply chain. An increase in automated trucks, drones and other technologies is leading to a sense of insecurity among traditional workers. However, these are bound to increase the industry's efficiency once regulatory hurdles are overcome and mass adoption becomes feasible. But their contribution will be quite limited in the next 10 years.

While the use of digital technology is threatening part of the workforce, it will also assist workers in completing their work more efficiently. It will enable the logistics providers to track each item in the supply chain and collect real-time data on all their assets.

Attracting and retaining the right talent will be the key to survival in the coming years

Companies throughout the industry are focusing on hiring and retaining the best talent and are competing with new market entrants as well as with their peers. Employees are challenging the current workplace and employment practices using digitalization and are demanding greater connectivity and mobility to fulfill their roles more efficiently, irrespective of their functions.

An increasing emphasis on software and connectivity is driving demand for the key skills and technologies needed to provide state-of-the-art functions and services. Attracting such talent puts the T&L companies against the tech industry, which often offers relatively attractive working models and incentives.

The rapid advance of digital technologies poses a real risk to a number of traditional labor-intensive roles across the transportation value chain. But like any technology revolution witnessed in history, these transformations will demand a new set of skills that the current talent pool will not be able to meet. Companies will need to think beyond attracting the right talent for today, but also invest in their workforce for the future.

Tony Canavan
 EY Global Government Transport Leader, Ernst & Young LLP



Majority

Of the transportation companies aim to focus on re-skill/train its workforce to better respond to the technology changes in the short term

Over the next 10 years, digital technology in T&L will lead to creation of **2 million** jobs and reduce carbon emissions by **10 million tons**. The value impact to the industry from key digital initiatives is expected to be **US\$1.5t**.

Over the next 10 years, autonomous trucks and drones could lead to a business impact of **US\$30b and 20b** respectively

Sources: World Economic Forum; Cerasis; Supply & Demand Chain Executive; Material Handling & Logistics; HIS; Willis Towers Watson Wire; HICL – Innovations and Strategies for Logistics and Supply Chains.

3.6 Heightened focus on sustainability and transparency

T&L companies face far greater pressure than ever before to inform stakeholders, government agencies and consumers about their ethical practices and sustainable supply chain processes. Government regulations are forcing companies to create sustainable supply chains. However, many T&L operators are going above and beyond those regulations, recognizing that sustainability is not only favorable to the environment and community relations, but can also be a differentiator with clients – and add to the bottom line.



Increasing global regulations – but inconsistencies add compliance and cost burden

The intense focus on sustainability has been a major component in regulatory agendas worldwide. Sustainable transport has long been recognized as a key development objective at various global forums.

Regulators are also increasing the pressure on compliance, governance and transparency, which is driving complexity into international operations and giving rise to new areas of risk.

T&L companies are driven by the need to comply with the increasing regulatory requirements, including product stewardship, forced labor, human trafficking and data privacy.

However, the often subtle variations in regulations pose a challenge and add significant cost to multinational companies, which struggle to comply with the inconsistent laws across countries and regions.

Suppliers are entering into shared commitment with companies

Supply chain programs are expanding beyond the normal regulatory compliance to focus on increasing value to stakeholders. As companies find strategic growth opportunities through sustainability, they will face growing scrutiny over labor conditions, workforce health and safety practices, and impact on the environment and the community.

Companies realize that vendors and subcontractors play an important role in achieving their sustainability goals. Therefore, they are investing in training, capacity building and incentives for their top performers in the supply chain. They are also expanding beyond their traditional relationship of auditing and monitoring, forging partnerships based on transparency and mutual goals.



13%

Logistics sector contribution to global emission in 2015



1.7%/year

Growth in the world trade in 2017 up from 2.8% in 2016



Usage of energy in transportation will increase globally from **106 exajoules (EJ) in 2013 to 128 EJ by 2030.**

Sources: World Energy Council, *UNCTAD Review of Maritime Transport, 2012*, *EY Building Responsible and resilient supply chains*, IRENA, *EY Automotive change drivers for the next decade*.

4. Deciphering the impact of technologies and digitalization using a transportation & logistics ecosystem framework

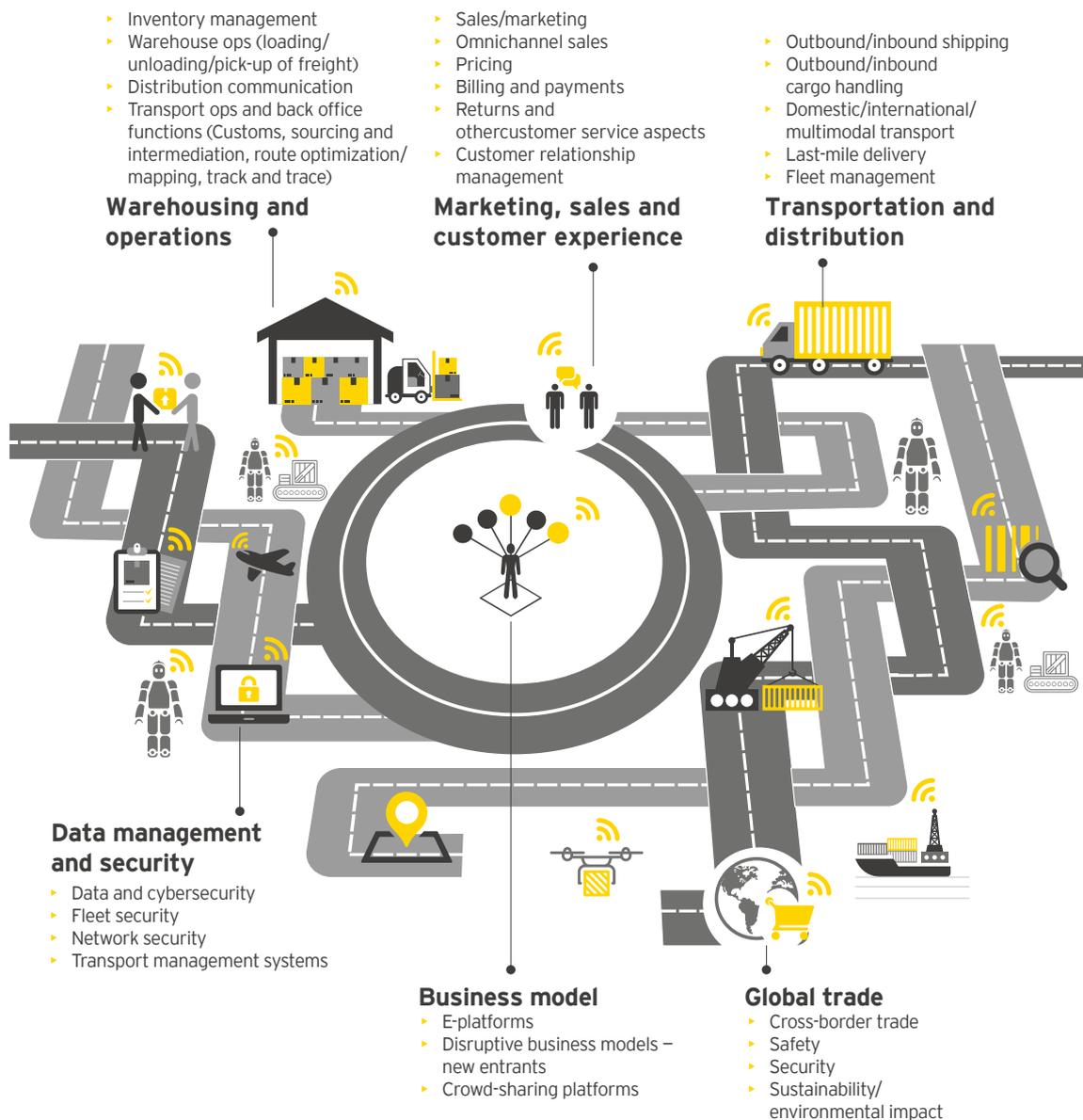
Technology is fundamental to the drivers of change transforming the T&L industry. To analyze the impact of these transformative forces including the impact of technology, we have developed a framework of the T&L industry ecosystem.

With the global scale and complexity of the logistics ecosystem, digitalization presents two broad but significant opportunities for T&L companies. The first will be to improve capacity utilization, operational efficiency and supply chain visibility, and thereby driving total landed cost optimization. The second will be to design new business models and create innovative product offerings.

Gaurav Malhotra

EY Digital Supply Chain and Operations Leader, Ernst & Young LLP

T&L ecosystem



We conducted a series of facilitated sessions and interviews with the sector experts in EY globally to identify the impact of change drivers on each part of the ecosystem and also identify technologies that will be critical to address those challenges. The following pages briefly summarize the key challenges affecting the ecosystem, the major technologies that will help address them and select use cases.

For this assessment, we have looked at a range of technologies disrupting the sector from analytics, autonomous vehicles, connected vehicles, robotics, digital collaboration, 3-D printing, IoT, augmented reality to platform-based models.

Future white papers will cover specific themes ranging from challenges to technologies.

4.1 Business model

Start-ups vs. incumbents: racing to disrupt



Business model

- ▶ Customer needs
- ▶ Internal and industry-wide collaboration
- ▶ Access vs. ownership

- ▶ Analytics
- ▶ IoT
- ▶ Digital collaboration

- Business priorities
- Technology enablers

A growing number of technology-enabled start-ups with innovative, asset-light business models will continue to disrupt the T&L industry by creating new market segments and capturing the market share of incumbents. Incumbents are also exploring opportunities to collaborate with new entrants that can augment their service offerings.

Based on the collective opinion of our industry professionals, the business model across the T&L value chain is undergoing a paradigm shift. Business customers are putting greater emphasis on transparency, speed, efficiency, reliability, and flexible products and services – all with the aim of optimizing the total landed cost of transportation.

Numerous start-ups are emerging as significant competition using innovative business models based on IoT, data analytics, digital collaboration and other technologies. With the explosion of data and intelligence, efficient data analysis has the potential to revolutionize business decision-making – from operational efficiency, cost management and budget optimization to customer management, dynamic pricing and predictive analytics. These technological developments are not only transforming the way companies (both B2B and B2C) structure their value chains but also how they interact with their customers.

The industry is witnessing increased collaboration with greater emphasis on access versus ownership of assets with companies adopting focused collaborative approaches for specific target customer groups. Peer-to-peer shipping apps, shared networks and crowdsourcing platforms are transforming the transportation industry. Many other new entrants are leveraging technology platforms and developing business models with the aim of minimizing inefficiencies and seeking first-mover advantage.

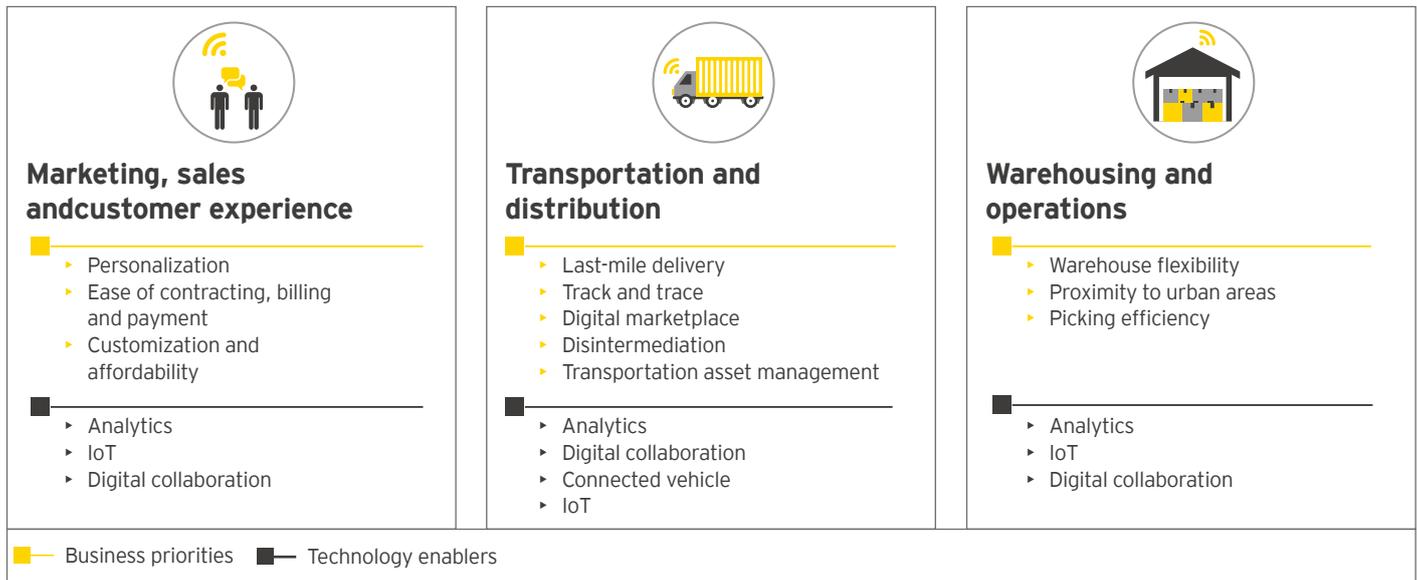
The role of transportation companies is shifting from goods in diverse packaging to transportation in standardized packages. Given the pace of rapid technological advances, it is easy to lose sight of the bigger picture. If incumbents fail to innovate and capitalize on the emerging technologies, they will miss out on the new market opportunities.

<p>18%</p> <p>Of T&L companies have impact of digital technology on the business model as the most critical boardroom agenda.</p>	<p>A leading China based e-commerce company has partnered with a Chinese Ship Liner to establish a shipping e-commerce platform providing direct ocean services to millions of companies on its e-commerce platform. This enables the small and medium-scale enterprise to bypass forwarders and book directly with various steamship lines.</p>	<p>An e-commerce company is developing an application to connect across all the modes of transport, eliminating the third-party middleman. The US-based app utilizes excess capacity of vehicles already on the road and analyzes registered drivers' travel patterns to provide a faster, cheaper and more efficient shipping alternative. The app was launched in January 2015 and currently has more than 25,000 registered drivers.</p>
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Sources: 16th EY Global Capital Confidence Barometer, Paste Media.

4.2 Marketing, sales, customer experience; Transportation and distribution; Warehousing and operations

Revolutionizing the value chain: producing actionable insights



We are in the early stages of a new computing era, revolutionizing the T&L industry value chain. Supported by new technologies, the wide sub-areas of the value chain including transportation, inventory management, warehousing, materials handling, sorting and packaging need to come together to produce actionable insights and end-to-end supply chain gains. This will impact sales, marketing, operations, warehousing, distribution and last-mile delivery.

We believe that the sales and marketing segment will be affected by rapidly changing customer fulfillment requirements in both the B2B and B2C segments. Consumers will expect the ability to initiate and receive packages digitally, track real-time status, and change pickup and drop-off locations at the last minute. Leveraging technologies that include analytics and other digital collaboration platforms, T&L companies are exploring the implementation of data-driven marketing strategies to produce deeper and more predictive insights into customer requirements.

For the transportation and distribution element of the value chain, last-mile delivery or the final leg is becoming increasingly complex and expensive. Constituting almost a quarter of the transportation costs, last-mile delivery is witnessing innovative technological developments, including automated delivery vehicles, drone deliveries and parcel lockers.

Also, tracing of the product across the supply chain continues to be a major interest for customers. Digital collaboration and IoT are expected to substantially enhance in-transit visibility.

For the warehousing and operations element, effective and flexible space utilization (in facility and across buildings) is paramount for companies competing for global market share. This part of the ecosystem will undergo structural changes and need a differently skilled workforce for the future when considering the technologies being developed such as laser-guided vehicles, mobile and packaging robots, item picking, packaging and material handling robots.

<p>One of the major retailers has invested more than US\$700 million in robotics and has ~30,000 robots working in its warehouses alongside human workers, saving the company ~US\$22 million in each fulfillment center.</p>	<p>A leading third-party logistics provider and freight forwarder launched a digital freight forwarding subsidiary designed to simplify shipping. It enables instant quotation, integrated document handling, milestone transparency, and proactive exception management.</p>	<p>A leading IT firm has partnered with a Singapore-based start-up to develop a network of storage lockers connected via blockchain. The project is aimed at creating a network of these lockers throughout Singapore, with the goal of providing a "last-mile" solution for consumers looking to keep track of their packages more easily.</p>	<p>One of the leading technology companies is rumored to be testing fixed-winged drones for package delivery in US.</p>	<p>One of the leading online grocery retailers uses a 5 Ghz radio control system to manage autonomous robots moving around a grid, storing and retrieving stacked crates. The company can control 1,000 robots from a single base station, communicating with them 10 times a second. The company also uses a cloud-based fulfillment and logistics smart platform.</p>
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Sources: The Seattle Times, Llyod List, Popular Mechanics, CoinDesk.

4.3 Data management and security

A fundamental transformation: demanding the review of strategic decisions



Data management and security

- Data expansion due to IoT and industry solution
- System security
- Managing high-value data volumes

- IoT
- Digital collaboration
- Analytics
- Blockchain

▬ Business priorities

▬ Technology enablers

The T&L industry is undergoing a fundamental transformation with the explosion of structured data, unstructured data and devices. It is becoming difficult to decipher the data in a meaningful way and make the best use of it. In addition, the industry's dependence on technology has also made it vulnerable to cybersecurity threats.

However, the emergence of technologies like IoT, data analytics and blockchain can help companies better understand data, track transactions and make strategic decisions throughout the supply chain. The effective use of big data can improve operational efficiency, customer experience and the creation of new business models. But it also raises challenges related to data capture, storage, searching, cutting, analysis and visualization.

Transportation is the third-most-targeted industry, and it is critically important to secure every aspect of the transportation infrastructure.

Still, technology is a net positive to the industry, thanks to several advances that put companies and consumers in the driver's seat:

Internet of Things: the IoT is set to become the next technological revolution and will generate significant value and data for the supply chain and logistics industry, with its impact being felt all across the big data universe. This will force logistics companies to upgrade their current tools, processes and technologies to accommodate the additional data volume and take advantage of the insights that the new data will deliver.

Blockchain: blockchain is termed a "trust less" network, meaning trust is not required to prove the validity of transactions, thus blockchain technology ensures that records can't be faked, duplicated or manipulated. Blockchain increases visibility in parts of the supply chain and promotes a level of trust. We expect the establishment of an industry-wide connecting "fabric" leveraging blockchain.

<p>A global bank conducted its deal using blockchain in September 2016 to guarantee trade of approximately US\$100,000 worth of cheese and butter between an agricultural food cooperative company and a trading company. The entire process, which usually takes 7 to 10 days, was completed in 4 hours.</p>	<p>One of the world's largest container ship liners is using blockchain expertise from an IT university to digitize its cargo inventory.</p>	<p>A port in Europe is participating in a blockchain consortium that is focusing on logistics. The consortium will be investing the next two years designing and developing applications for blockchain technology in the logistics sector.</p>	<p>A European carrier had to cancel its 10 flights due to a cyberattack on its ground computer systems in 2015.</p>
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Sources: RTInsights.com, World Economic Forum, eyefortransport.

4.4 Global trade

Global trade under pressure: creating a more streamlined supply chain



Global trade

- ▶ Increasing automation
- ▶ Unpredictability of economic and political environment
- ▶ Local sourcing regulation

- ▶ Analytics
- ▶ Digital collaboration
- ▶ RPA

■ Business priorities
■ Technology enablers

Growth in global trade demands higher efficiency, faster turnaround, and a reduction in cost. With the increasing complexity of logistics processes, companies involved in international trade need to explore options to alleviate complexity and create a more streamlined supply chain.

Geopolitical risk and stability are top concerns among companies with a global presence. Countries with weaker political, economic or financial scenarios pose the threat of artificially disrupting the supply chain. As the supply chains continues to globalize, companies' ability to participate depends greatly on their government's policy choices.

Cloud, big data and embedded analytics are improving the speed of decision-making and have replaced traditional business intelligence tools. Instead of creating expensive projects that take years to implement and wind up being outdated or irrelevant when completed, a broader spectrum of information services can be accessed, which increases speed to market at a fraction of the cost. These tools can predict or prescribe the outcome of a government's decisions on the supply chain, and companies can adjust to those decisions accordingly.

Another technology that can greatly assist in cutting costs and time is automation. This technology is changing the structure of traditional warehouse operations, starting with

distribution centers across the global supply chain. With the rise of e-fulfillment centers and centralized distribution centers, companies are seeking ways to maximize efficiency and accuracy through the use of automated materials handling equipment, high-speed conveyor systems and robotic applications.

Today's next-generation warehouse supply chain solutions include voice-directed technology, wearables, radio frequency identification (RFID) scanning, pick/put-to-light, auto-guided vehicles (AGVs) for storage and retrieval, and robotic applications.

<p>A large independent pharmaceutical distributor in the US adopted a cloud-based analytical platform enabling it to play a more strategic role in its relationship with partners and customers. It has transitioned from a product distributor to an information service provider in 4 hours.</p>	<p>A global medical technology company built a global manufacturing network for its disposable syringe business, with production facilities in the United States, Ireland, Mexico and Brazil. When the Mexican peso was devalued, the company quickly shifted its production to the Mexican plant, gaining from a cost advantage over its competitors' US factories.</p>	<p>A leading hardwood flooring retailer in the US faced massive losses and fines as it did not check to see where the flooring was originating. Its suppliers falsified information about the source of the flooring and the certifications.</p>
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Sources: CBS Interactive, GlobalTrade, SAGE businessresearcher.

5. How can Transportation and Logistics companies prepare?

Transportation and Logistics activities are going to remain critical as the world becomes more populous and connected, but they will be very different from today. While we have the directional view of industry's future, the specifics of "when" remain uncertain. To prepare for this uncertainty, companies need to take a cultural transformation, striving to be more nimble and innovative. Thus, it is critical to encourage experimentation and learn from them.

For some time, the T&L industry has been evolving, with consolidation of players and companies seeking to provide an integrated portfolio of logistics services to address shipper needs. The industry is in the 24th hour before the tectonic shift happens.

Companies need to think and act as challengers. Now is the time to review their purpose and corporate strategy, business model and enterprise operating model to identify areas that need immediate attention or change in the near future.

Business and individual customers expect the transparent digital experience from T&L companies today. The value has clearly shifted from transportation to services around the first and last mile of the delivery process. This is challenging the core business model and inducing companies to look outside their own sector for best-fit assets through a mix of organic growth and strategic acquisitions.

Jim Doucette

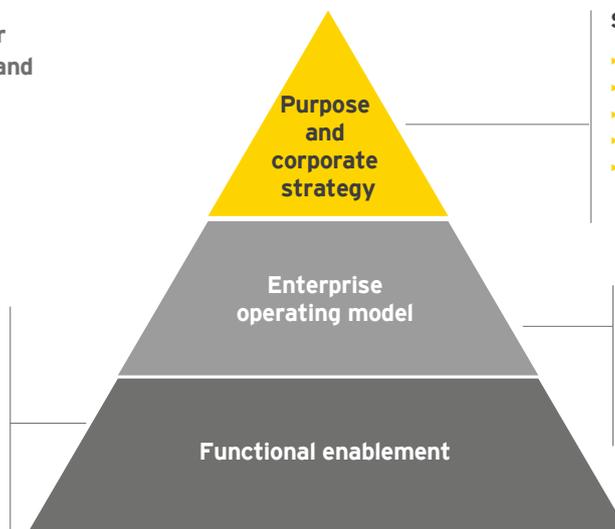
US Corporate and Growth Strategy Leader,
Ernst & Young LLP

Activate your strategy with effective enterprise operating model

Purpose is an aspirational reason for being that is grounded in humanity and inspires calls to action

People, process, technology and governance:

- ▶ Performance metrics
- ▶ Processes and governance structure
- ▶ Workforce engagement
- ▶ Technology platform integration, data and tools



Strategy decisions:

- ▶ Purpose
- ▶ Corporate strategy
- ▶ Market focus and priorities
- ▶ Capital allocation
- ▶ Business model

Operating model considerations:

- ▶ Business structure decisions
- ▶ Capability design decisions including sourcing, placement, distribution, etc.

EY's Automotive & Transportation Sector delivers purpose-led, transformative solutions to help our clients improve the movement of people and goods around the world. We build a better working world by teaming with public and private companies throughout the sector to:

- ▶ Innovate and implement new business models to harness emerging digital and connected vehicle technologies
- ▶ Better connect with customers to drive loyalty and grow market share
- ▶ Create world-class supply chains to grow business and manage risk
- ▶ Improve business outcomes through M&A and investment decisions
- ▶ Navigate volatile markets and changing regulations

We guide our clients throughout their journey from strategy review through business model transformation to operations and ongoing risk management. We address big, complex issues and opportunities to deliver better working outcomes that grow, optimize and protect our clients' businesses now and in the future.





Sector contacts

Randy Miller

EY Global Automotive & Transportation Sector Leader
Email: randall.miller@ey.com
Phone: +1 313 628 8642

Kevin Custis

Principal, Senior Leader Transportation Sector Executive Team
Email: kevin.custis@ey.com
Phone: +1 404 817 4747

Gaurav Malhotra

Digital Supply Chain and Operations Leader, Ernst & Young LLP
Email: gaurav.malhotra1@ey.com
Phone: +1 312 879 4463

Jim Morton

US Logistics Practice Leader, Ernst & Young LLP
Email: jim.morton@ey.com
Phone: +1 904 633 3115

Anil Valsan

EY Global Automotive & Transportation Lead Analyst
Email: avalsan@uk.ey.com
Phone: +44 7903 206464

Gyula Kangiszer

Innovation and Digital Strategy, Ernst & Young LLP
Email: gyula.kangiszer@ey.com
Phone: +1 323 791 4092

Brian D. Lynch

Logistics & Supply Chain Transaction Advisory Services, Ernst & Young LLP
Email: brian.lynch2@ey.com
Phone: +1 216 583 2914

Regan Grant

EY Global Automotive & Transportation Marketing Leader
Email: regan.grant@ey.com
Phone: +1 313 628 8974

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