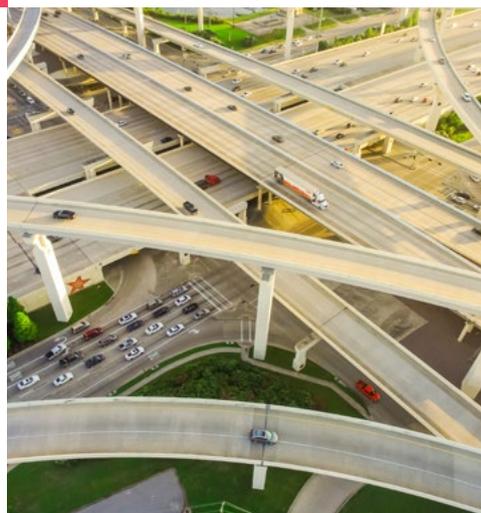


# Shifting patterns

The future of the logistics industry



PwC's future in sight series



[www.pwc.com/transport](http://www.pwc.com/transport)

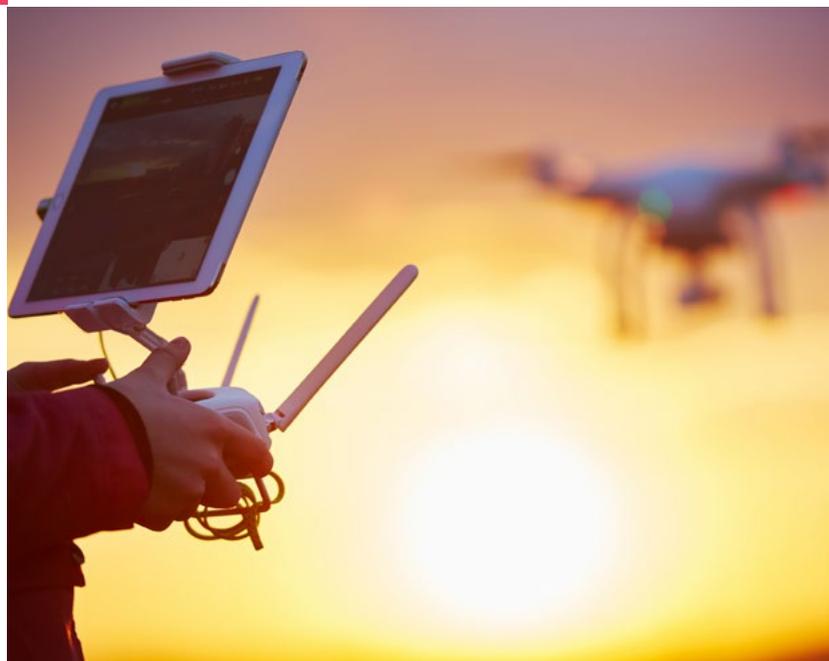
## Contents

<i>Executive summary</i>	<i>2</i>
<i>Introduction</i>	<i>3</i>
<i>Disruption and uncertainty</i>	<i>5</i>
<i>Changing customer expectations</i>	<i>5</i>
<i>Technological breakthroughs</i>	<i>6</i>
<i>New entrants to the industry</i>	<i>8</i>
<i>Redefining collaboration</i>	<i>9</i>
<i>Logistics scenarios</i>	<i>11</i>
1. <i>Sharing the PI(e)</i>	<i>12</i>
2. <i>Start-up, shake-up</i>	<i>13</i>
3. <i>Complex competition</i>	<i>14</i>
4. <i>Scale matters</i>	<i>15</i>
<i>Leading through uncertainty</i>	<i>16</i>
<i>Learn more</i>	<i>17</i>

The trick to seeing the future...  
is knowing where to look for it.

PwC's future in sight series brings together our insights and perspectives on the disruptive forces we believe will have a transformative impact on the future.

[www.pwc.com/futureinsight](http://www.pwc.com/futureinsight)



---

## Executive summary

*Like most other industries, transportation and logistics (T&L) is currently confronting immense change; and like all change, this brings both risk and opportunity. New technology, new market entrants, new customer expectations, and new business models. There are many ways the sector could develop to meet these challenges, some evolutionary, others more revolutionary. In this paper we discuss four key areas of disruption logistics companies need to focus on now, and explore some possible futures of the industry.*

### Four areas of disruption

**Customer expectations** are increasing greatly. Both individuals and businesses expect to get goods faster, more flexibly, and – in the case of consumers – at low or no delivery cost. Manufacturing is becoming more and more customised, which is good for customers but hard work for the logistics industry. Add it all up and the sector is under acute and growing pressure to deliver a better service at an ever lower cost.

It can only hope to do this by making maximum and intelligent use of **technology**, from data analytics, to automation, to the ‘Physical Internet’. This promises lower costs, improved efficiency, and the opportunity to make genuine breakthroughs in the way the industry works. But ‘digital fitness’ is a challenge for the sector, which is currently lagging many of its customers in this respect. Attracting the right skills is one issue, but developing the right strategy is even more crucial.

An increasingly competitive environment is another big factor in the mix. Some of the sector’s own customers are starting up logistics operations of their own, and **new entrants to the industry** are finding ways to carve out the more lucrative elements of the value chain by exploiting digital technology or new ‘sharing’ business models, and they don’t have asset-heavy balance sheets or cumbersome existing systems weighing them down.

‘Sharing’ is a big story for logistics now – from Uber-style approaches to last-mile delivery, to more formal JVs and partnerships at corporate level, the whole sector is **redefining collaboration**. But much of this is hampered by inconsistencies in everything like shipment sizes, processes or IT systems. The Physical Internet promises great things for the sector, coming along with increased standardisation in logistics operations.

### Possible futures

What will the logistics marketplace look like in five to ten years? That’s still a very open question. We took a closer look at how some of the key disruptions facing the industry may interact. The future scenarios we explore involve combinations of these four factors, weighted according to how important specific trends become:

**Sharing the PI(e)**: the dominant theme in this scenario is the growth of collaborative working, which allows the current market leaders to retain their dominance. This could for example see a greater use of ‘Physical Internet’ (or ‘PI’) solutions, based on a move towards more standardised shipment sizes, labelling and systems.

**Start-up, shake up**: in this scenario new entrants in the form of start-ups make a bigger impact. The most challenging and costly last mile of delivery, in particular, becomes more fragmented, exploiting new technologies like platform and crowd-sharing solutions. These start-ups collaborate with incumbents and complement their service offers.

**Complex competition**: here the competitive set evolves in a different direction, as large industrial or retail customers and suppliers become players in the logistics market themselves, not just managing their own logistics but turning that expertise into a profitable business model.

**Scale matters**: and finally, in this scenario, the current market leaders compete for a dominant market position by acquiring smaller players, achieving scale through consolidation, and innovation through the acquisition of smaller entrepreneurial start-ups.

We hope this paper will help you assess the trends and developments most likely to affect your own business, and start to develop a strategy to ensure continued profitability through this time of intense change.

---

## Introduction

*Logistics companies are facing an era of unprecedented change as digitisation takes hold and customer expectations evolve. New technologies are enabling greater efficiency and more collaborative operating models; they're also re-shaping the marketplace in ways that are only just beginning to become apparent. New entrants, whether they be start-ups or the industry's own customers and suppliers, are also shaking up the sector.*

The race is on to define the industry's future. And with an estimated US\$4.6 trillion<sup>1</sup> of revenues at stake, companies can't afford to sit back and watch; they need to adapt to changing markets proactively.

We've developed a transformation framework to describe how megatrends<sup>2</sup> affect a given industry, taking into account the key disrupting forces that create uncertainties for every organisation in the sector. Based on these uncertainties, we outline distinct scenarios to explore possible futures for the sector. This framework will help you plan for this uncertain and volatile future.<sup>3</sup>

For the logistics industry, we start by taking a closer look at some of the key disrupting factors: changing customer expectations, technological breakthroughs, new entrants to the industry, and new ways to compete or collaborate. These disruptions have very different implications for individual companies, depending on which segments they operate in, their type of ownership, and where they are located. They also don't exist in a vacuum: in each case, the interactions between them are equally, if not more, important. Government intervention and trade flows between regions and territories are influencing the industry too, but very much depend on national politics and geography.

---

1 <https://www.plunkettresearch.com/industries/transportation-supply-chain-logistics-industry-market-research/>

Note: various estimates available, high variance, distinct approaches, difficult to measure given insourced and outsourced portions of the total market

2 <https://www.pwc.com/us/en/faculty-resource/assets/symposium/2014-megatrends-overview.pdf>

3 At PwC, we are analysing potential futures for various industry sectors and some papers are already published (see list on page 20).

## Defining 'Logistics' for this paper

There are a number of distinct business models in the industry, although they can overlap, and individual companies may operate under more than one model. In this paper, we consider logistics service providers (LSP), carriers, and courier / express / parcel (CEP) companies. Postal operators, too, are relevant players in the context of logistics and CEP.

Not only business models but profitability and margins differ considerably. In contrast with other industries, profits in logistics are relatively low. Yet, within this sector, EBIT margins generally range from -1% to 8%. While carriers find themselves close to zero profit, sometimes even in the red, the large CEP companies end up being the most profitable group, sometimes reaching double-digit profit margins.<sup>4</sup>

Customers in the logistics industry comprise of both B2B and B2C segments. The major part of the total market can be linked to B2B transactions, with LSPs and carriers accounting for the biggest portion of industry revenue. CEP represents a smaller, but faster growing segment; and just about a third of CEP revenues can be attributed to B2C.

Segment	Business Model		Customer
B2B	LSP	Freight forwarders, 3rd and 4th party logistics service providers	Manufacturers, wholesalers, and retailers
	Carriers	Trucking, rail freight, sea freight and air freight companies	LSPs
	CEP	Courier / Express / Parcel companies	Retailers, manufacturers, and other companies
B2C	CEP	Courier / Express / Parcel companies	Private consumers

Our four logistics scenarios for the future of the industry are based primarily on the different ways collaboration and competition could evolve within the sector:

- **Sharing the PI(e):** the dominant theme in this scenario is the growth of collaborative working, which allows the current market leaders to retain their dominance. This could for example see a greater use of 'Physical Internet' (or 'PI')<sup>5</sup> solutions, based on a move towards more standardised shipment sizes, labelling and systems.
- **Start-up, shake up:** in this scenario new entrants in the form of start-ups make a bigger impact. The most challenging and costly 'last mile' of delivery, in particular, becomes more fragmented, exploiting new technologies like cloud platforms and crowd-sharing. These start-ups collaborate with incumbents and complement their service offers.

- **Complex competition:** here the competitive set evolves in a different direction, as large industrial or retail customers and suppliers become players in the logistics market themselves, not just managing their own logistics but turning that expertise into a profitable business model.
- **Scale matters:** and finally, in this scenario, the current market leaders compete for a dominant market position by acquiring smaller players, achieving scale through consolidation, and innovation through the acquisition of smaller entrepreneurial start-ups.

Together these logistics scenarios map out a range of possibilities for the context in which every company will need to compete in the future. That in turn provides a basis for evaluating how resilient and 'fit for growth' current strategies and plans are.

Regardless of whether one logistics scenario comes closest to the truth for your segment of logistics and geographical environment, or whether your future combines elements from several, each company will need to adapt their current strategy to cope. That may mean reassessing business models, the operating model and capabilities, HR strategies, financial performance, and the organisation's purpose. We suggest some possible directions in our final chapter. More detailed views on particular regions, segments and capabilities are still to come in later articles.

<sup>4</sup> Strategy& analysis (peer groups of listed companies in each segment; average EBIT margins of the past 5 financial years)

<sup>5</sup> The term 'PI(e)' is here built into the phrase 'Sharing the pie', but also alludes to the Physical Internet, often referred to as 'PI'; for more detail see page 9

---

# Disruption and uncertainty

## Changing customer expectations

*Like individual consumers, industrial customers now expect to get shipments faster, more flexibly, and with more transparency at a lower price. No surprise that across the industry, both operating models and profitability are under strain. And the pace of transformation for large manufacturing and retail customers may turn out to be even faster than for private final consumers.*

### **B2B: Striving for efficiency and transparency**

Manufacturing industries are facing far greater expectations around efficiency and performance than ever before. Their customers expect faster time-to-market, reduced defect rates and customised products. Ultimately, the result may be a goal that was once impossible: a 'lot size of one', where each product is manufactured to the specifications of a specific end-customer. The advent of the industrial Internet of Things and what other research refers to as 'Industry 4.0' is allowing manufacturing companies, whether they make industrial equipment, cars, planes, or consumer goods, to redefine everything from the way they interact with customers to how they structure supply chains.

All this has huge implications for transportation and logistics. LSPs – in particular 3PLs and 4PLs – need to integrate data analytics and social supply chains to provide much better traceability and predictability (not to mention lower costs); smart warehousing solutions will become essential. The implications are clear: 'digital fitness' is becoming a must for every logistics company.

### **B2C: New shopping patterns**

Many logistics companies also serve B2C customers. Consumers went digital long before many of the retailers, and some parts of the sector are still struggling to keep up. The leading players are adopting what we call 'total retail', which is an operating model across bricks and mortar, online mobile and other retail channels.<sup>6</sup> Total retail is complemented by 'connected retail', where retailers aim to create a seamless brand experience for the customer across personalised marketing, the physical store, the digital experience, and the payment options, all of it driven by a strong coherent brand.<sup>7</sup> What are the consequences for the logistics industry?

Shippers aren't generally part of a branded retail experience. Most private end-consumers are what we call 'shipper-agnostic': they don't care who delivers their goods, as long as they get them reliably, quickly and cheaply. Many want more flexible delivery – whether in terms of when or where they get their goods - and most aren't willing to pay for shipping: they expect it to be free, though they are prepared to pay a premium for additional services, such as faster delivery for high-value items. There's also currently a low acceptance of dynamic pricing for parcels; customers expect to pay the same price for shipping regardless of seasonal capacity constraints faced by their shipper, with the exception of surcharges for same day, overnight or expedited service.

---

<sup>6</sup> <http://www.pwc.com/totalretail>

<sup>7</sup> PwC, Connected Retail: Reshaping tomorrow's operating model and metrics, 2015

## Technological breakthroughs

Technology is changing every aspect of how logistics companies operate. 'Digital fitness' will be a prerequisite for success: the winners will be those who understand how to exploit a whole range of new technologies, from data analytics to automation and platform solutions. Those who don't, risk obsolescence. But with so many technologies competing for management attention and investment, defining a clear digital strategy that's integrated into business strategy will be critical.

### Digital is still a challenge for the sector

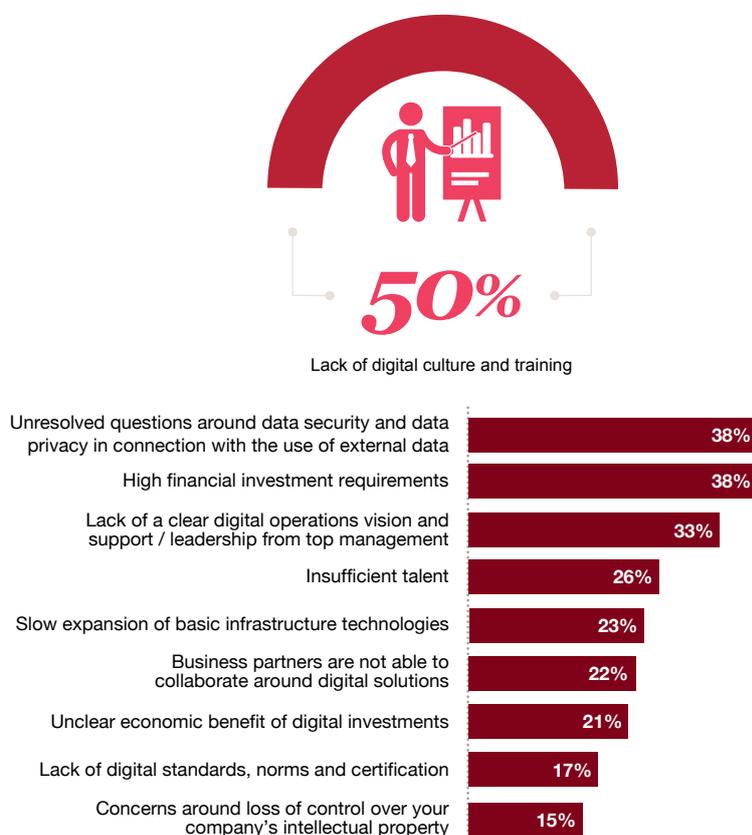
There is no other industry where so many industry experts ascribe a high importance to data and analytics in the next five years than transportation and logistics – 90% in T&L compared to an average of 83%.<sup>8</sup> The sector has never had access to more data. There are vast opportunities here to improve performance and serve customers better, and LSPs who are part of a digitally integrated value chain can benefit from significantly improved forecasting to scale capacity up or down and plan routes. Adding machine learning and artificial intelligence techniques to data analytics can deliver truly dynamic routing.

Cloud technology can enable platform solutions, which in turns makes it possible to use new business models, such as 'virtual freight forwarding'. It can also provide flexibility and scalability, as well as standardised and harmonised processes across the whole organisation. That's especially important for those LSPs or carriers who have grown through acquisitions, and currently rely on a patchwork of legacy systems.

The potential is huge, but the industry has thus far been slow to seize it. In our recent Industry 4.0 study, the percentage of T&L companies that rated

themselves as 'advanced' on digitisation was just 28%. Some of the industry's customers are already well ahead of this – 41% of automotive companies and 45% of electronics companies already see themselves as advanced. The lack of a 'digital culture' and training is thus the biggest challenge for transportation and logistics companies. T&L firms are in line with other industries in planning to invest 5%<sup>9</sup> of their revenues per annum until 2020, but the next few years will be critical: companies that don't start soon risk being left behind permanently.

**Figure 1: Lack of digital culture and training is the biggest challenge facing transportation and logistics companies**



Note: Included as one of three possible responses

**Q: Where are the biggest challenges or inhibitors for building digital operations capabilities in your company?**

Source: <http://www.pwc.com/gx/en/transportation-logistics/pdf/transportation-logistics-key-findings.pdf>

8 <https://www.pwc.com/gx/en/industries/industries-4.0/landing-page/industry-4.0-building-your-digital-enterprise-april-2016.pdf>

9 Ibid.

## Automation could reshape the workforce

Labour is a critical element of any logistics operating model, and up till now there's always been a trade-off between service levels and costs. But automation breaks down this equation, allowing firms to offer better service and save money at the same time. Some of the industry's most labour-intensive processes are on the way to being fully or partially automated, from warehousing to last-mile delivery.

Automated solutions in the warehouse are already being implemented and their level of sophistication is increasing. For example, automated loading and unloading systems are already available, but in the future these are likely to be able to bypass obstacles and adjust routes automatically. Advances in data

processing and optics now allow tasks to be automated which were once thought too complex – like trailer loading and offloading at acceptable speeds.

Package delivery could also make more use of automation, through innovations like autonomous vehicles or delivery drones. Google has already started working on self-driving lockers and the trucking industry is partnering with OEMs on partially automated truck convoys. Even if more radical solutions are a long time coming, other technologies which could make drivers more efficient are in the offing too, like augmented reality solutions that give drivers more information about their environment and the packages still on board.

We've mapped out some of the most important technologies in the table facing this page. The rate of adoption of any of the technology opportunities discussed here will not be limited by technical advancement rate. Instead it will be driven by the rates of regulatory and customer acceptance.

The technology <sup>10</sup>	The impact	The uncertainties
Physical Internet (based on the IoT)	<ul style="list-style-type: none"> <li>Improved supply chain transparency, safety and efficiency</li> <li>Improved environmental sustainability (more efficient resource planning)</li> </ul>	<ul style="list-style-type: none"> <li>Social expectations around data privacy and security may change</li> <li>Regulation around data security and privacy may increase or be enforced more stringently</li> <li>The sector's willingness and ability to invest in collaboration</li> <li>Whether international bodies will drive standardisation</li> </ul>
IT standards	<ul style="list-style-type: none"> <li>Enabling collaboration horizontally</li> <li>More efficiency and transparency</li> </ul>	<ul style="list-style-type: none"> <li>Companies' willingness to adopt is uncertain due to data security concerns</li> </ul>
Data analytics	<ul style="list-style-type: none"> <li>Improvements in customer experience and operational efficiency in operations</li> <li>Greater inventory visibility and management</li> <li>Improved 'predictive maintenance'</li> </ul>	<ul style="list-style-type: none"> <li>Rate of development of data processing capacity is unclear</li> <li>Question marks around data security</li> <li>Social expectations around data privacy and security may change</li> <li>Regulation of data security and privacy may increase or be enforced more stringently</li> </ul>
Cloud	<ul style="list-style-type: none"> <li>Enabling new platform-based business models and increasing efficiency</li> </ul>	<ul style="list-style-type: none"> <li>Development of costs unclear (once a certain scale is reached physical data centres still tend to be cheaper)</li> <li>Uncertainties around data security</li> </ul>
Blockchain	<ul style="list-style-type: none"> <li>Enhanced supply chain security (reduction of fraud)</li> <li>Reduction in bottlenecks (certification by 3rd parties)</li> <li>Reduction of errors (no more paper-based documentation)</li> <li>Increased efficiency</li> </ul>	<ul style="list-style-type: none"> <li>Rate of adoption uncertain</li> <li>Unclear whether one or two dominant solutions will emerge or multiple competing solutions</li> </ul>
Robotics & automation	<ul style="list-style-type: none"> <li>Reduction in human workforce and increased efficiency in delivery and warehousing (including sorting and distribution centres)</li> <li>Lower costs</li> </ul>	<ul style="list-style-type: none"> <li>Speed of technology development unclear</li> </ul>
Autonomous vehicles	<ul style="list-style-type: none"> <li>Reduction in human workforce</li> <li>Increased efficiency in delivery processes</li> </ul>	<ul style="list-style-type: none"> <li>Regulatory environments not currently in place in most countries</li> <li>Liability issues not yet clear</li> <li>Ethical questions remain especially in relation to emergency situations</li> </ul>
UAVs / Drones	<ul style="list-style-type: none"> <li>Increased cost efficiency (use cases: inventory, surveillance, delivery)</li> <li>Workforce reduction</li> </ul>	<ul style="list-style-type: none"> <li>Regulation in most countries not sufficient for commercial use in public areas like delivery</li> <li>Safety and privacy concerns may hamper market acceptance</li> </ul>
3-d printing	<ul style="list-style-type: none"> <li>Lower transportation demand</li> <li>Transported goods would mostly be raw materials</li> </ul>	<ul style="list-style-type: none"> <li>Speed, scale, and scope of uptake by customer industries still unclear</li> </ul>

<sup>10</sup> For a list of PwC publications on these technologies please refer to page 18

## New entrants to the industry

Platform technology has given rise to new business models, often driven by start-ups that enter the logistics industry. New 'sharing' business models could have as much of an impact on the sector as new technology. And the industry's current customers and suppliers may end up being the biggest new entrants.

### Start-ups drive new business models

Most of the new entrants to the logistics sector are start-ups, and many of these are looking to use new technology to enter the industry. To date most of these are in 'asset light' parts of the value chain; for example, virtual freight forwarders. These asset-less or asset-light businesses exploit digital technology to offer interactive benchmarking of freight rates, or match shippers with available capacity.

Many of the new entrants in freight forwarding are basing their offering on more agile pricing. Some enable carriers to bid on loads, allowing them to lower their bids in order to fill up capacity. They're also providing quotes more quickly and increasing price transparency – for example, by linking via API directly to a large number of carriers, and providing customers with their negotiated rates for each of the carriers they use so they can compare directly.

Last-mile delivery has also seen a wave of start-ups in recent years. Some of these companies are using technology to tap into the 'sharing economy' by matching available capacity with delivery needs. Uber, currently the largest crowd-sharing platform for passenger transit, has its eye on the logistics markets too. It has established an UberCARGO van service in Hong Kong<sup>11</sup>, and UberRUSH is offering express services by targeting online retailers.<sup>12</sup> Dolly, another start-up headquartered in the US, has a similar

approach and helps people to get things transported within their city by connecting them with registered drivers.<sup>13</sup> Norwegian start-up Nimber matches commuters and travellers with consumers looking to ship something, whether it be a piano across the country or a skateboard or document across town.<sup>14</sup>

How are traditional logistics companies countering these developments? They know they need to explore opportunities for new products and services – a field where start-ups have a clear advantage given their freedom from outmoded processes and hierarchical structures. Yet investments by traditional LSPs in digital logistics start-ups only constitute around 6% of overall venture capital flows.

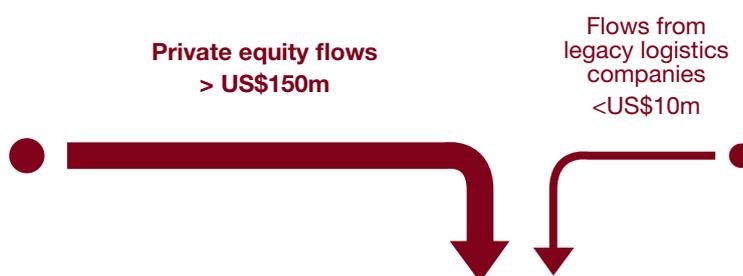
### Start-ups aren't the only new entrants

Major players from other industries may have even more potential to shake up the industry's competitive dynamics. Autonomous vehicles are one possible example: technology players, or technology-automotive collaborations may enter the industry, especially with ideas like self-driving lockers, or machine-to-machine parcel-station loading for last-mile delivery. Crowd-sharing platforms may also emerge from autonomous vehicle development, or independently. As car-sharing increases, so may the use of the storage space available in these vehicles as a flexible way to expand capacity.

The industry's own customers may also become significant new entrants. Amazon is an obvious example: it's looking to expand its in-house expertise in warehousing as well as develop its own delivery capabilities. Hence its acquisition of a warehouse automation specialist, now part of its Amazon Robotics business unit. The company has leased 20 aircrafts to handle more of its own shipments<sup>15</sup>, and is piloting a 'Prime Air' 30-minute delivery offering using drones.<sup>16</sup> Bloomberg has also reported that Amazon has plans to launch its own logistics offerings, a project, allegedly referred to as 'Dragon Boat'.

In Asia, Alibaba is trying to improve delivery services for its sellers by setting up Cainiao, a JV with several logistics companies, a department store, an investment firm and a company with port logistics operations.<sup>17</sup> The main advantage for network members constitutes the access to a logistics data platform, which helps them to achieve efficiencies in order fulfilment by leveraging their capacity and capabilities at a large scale.<sup>18</sup> And the company is trying out new ideas too, like an app that allows consumers to request a pick-up of a return or package from delivery personnel in the area.<sup>19</sup>

**Figure 2: Venture capital flows into digital logistics startups since 2011\***



\* Totals are not exhaustive. Our estimates of capital flows are based on analysis of most prominent and publicised startups.

Source: Strategy & analysis based on Bloomberg and Crunchbase reports.

11 <http://techcrunch.com/2015/01/08/uber-cargo/>

12 <https://rush.uber.com/how-it-works/>

13 <http://chicago.inno.streetwise.co/2014/08/13/chicago-startup-dolly-is-the-uber-for-moving-your-stuff/>

14 <https://www.nimber.com/>

15 <http://www.reuters.com/article/us-air-transport-sr-amazon-com-idUSKCN0WB1LA>

16 <http://www.amazon.com/b?ie=UTF8&node=8037720011>

17 <http://technode.com/2013/05/28/alibaba-officially-launches-the-csn-logistics-program/>

18 [http://hsprod.investis.com/ir/alibaba/2016\\_Alibaba\\_20-F.pdf](http://hsprod.investis.com/ir/alibaba/2016_Alibaba_20-F.pdf)

19 Ibid.

## Redefining collaboration

*Horizontal collaboration is already happening, especially in last-mile delivery, but it's hampered by inconsistencies. Higher levels of efficiency could be achieved by more consistent standards, defined through the Physical Internet and increased collaboration, whether in the form of alliances, joint ventures or M&A.*

### **Building on last-mile partnerships**

There are already notable examples of market players operating collaboratively. Companies like FedEx and DHL have been partnering with national postal companies and small local players for many years. But with the advent of new technology, collaboration can become much more dynamic.

However, fragmentation, accountability, and a lack of consistency make collaboration more difficult. For example, each company has its own labelling system, and some companies are wary of farming out the crucial last mile of the journey to an operator that may not reflect its own brand and service levels. And aside from the last mile, partnering agreements are the exception, rather than the rule. Take freight forwarding. While containers are a standard size, the packages that go into them aren't. Nor are the forms and digital entries used to clear customs. Contract logistics companies co-operate extensively with shippers, but often don't share resources with competitors.

### **Collaboration and standardisation would increase efficiency**

For many industries, the standard assumption is that a larger number of competitors is beneficial for customers. However, in certain logistics sectors, there are substantial benefits in having more consolidation, not less. According to one estimate, a 10% to 30% increase in efficiency in the EU logistics sector would translate into 100-300 billion in cost savings for European industry.<sup>20</sup> The Physical Internet could help address this 'grand challenge' by drastically increasing co-operation between companies and across transport modes through greater standardisation (see info box 'From manifesto to reality').

For the Physical Internet to work in practice, though, companies would need to be willing to collaborate far more extensively than they do today. Most of the 535,000 distribution centres in the US are standalone operations owned by different companies; imagine the savings if they were all connected, and physical workflows were standardised for maximum efficiency.

### **Other new types of collaboration**

There are many other less radical ways for logistics companies to use assets more efficiently by collaborating. For example, by sharing fleets and networks, and establishing agreements similar to the airlift purchased by postal agencies from commercial couriers, or the code-sharing used by airlines. DB Schenker, for example, recently signed a five-year contract with the online freight exchange provider uShip, to develop a platform to connect truck drivers and shipments more efficiently.<sup>21</sup>

Many companies in the sector are also turning to M&A, joint ventures, and alliances as a way to achieve collaboration. In 2015, M&A deal value nearly doubled compared to 2014, with much of this activity driven by large players looking to expand their international operations and service offerings. But with disruption on the horizon, there may be opportunities to use deals to enhance capabilities in key areas too; digital is a good example.

### **From manifesto to reality: defining the Physical Internet**

The term 'Physical Internet' (PI or  $\pi$ ); was first coined by Professor Benoit Montreuil of the Georgia Technology Institute in 2011. It's based on the idea that physical objects can be more efficiently moved around if they become more standardised and share common channels, like data packets on the internet. That requires modularisation and standard interfaces and protocols. In addition, hubs and networks across transport modes will need to be better synchronised, and IT applications and networks will also need to operate together. Montreuil's manifesto proposes  $\pi$  containers in standard dimensions that can be efficiently stacked together, potentially with sensors if appropriate, and sealable for security purposes. To make the most of these,  $\pi$  movers and  $\pi$  loading systems will need to be developed too, as well as more efficient transport models.

20 [http://ec.europa.eu/research/transport/news/items/alice\\_lauch\\_en.htm](http://ec.europa.eu/research/transport/news/items/alice_lauch_en.htm)

21 <http://www.wsj.com/articles/db-schenker-signs-on-with-uship-online-freight-platform-1467235737>



# Logistics scenarios

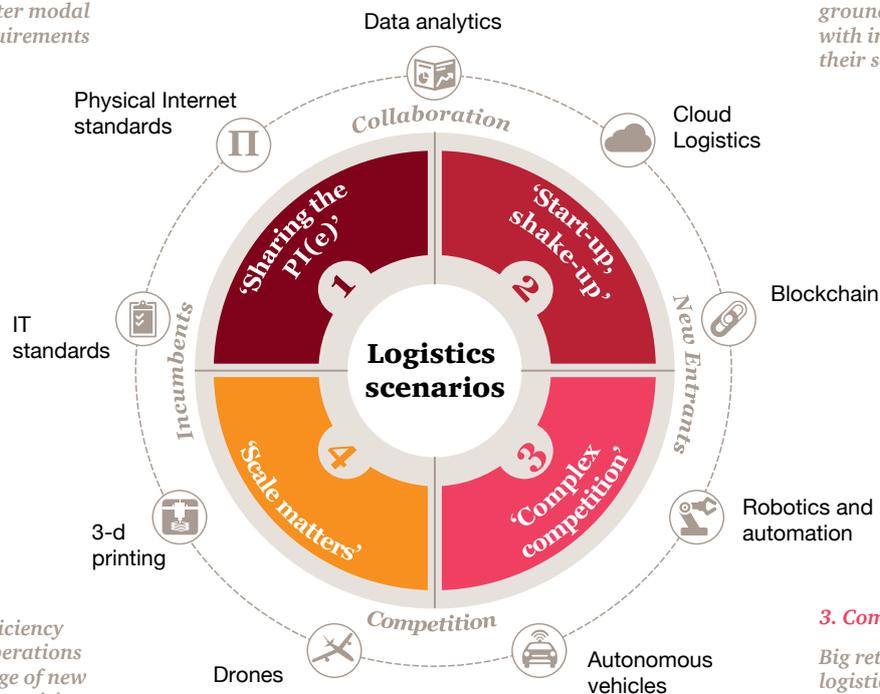
What will the logistics marketplace look like in five to ten years? That's still an open question. In this chapter we take a closer look at how some of the key disruptions facing the industry may interact. We have done this by describing four logistics scenarios. In each of these, technology plays a key role, but affects the market in different ways. In two of the models, new entrants are the primary drivers of change, while incumbents retain a dominant position in the other two. The nature of market dynamics, especially the level of collaboration versus competition, also varies between the scenarios.

## 1. Sharing the PI(e)

Incumbents increase their efficiency and reduce their environmental impact by collaborating more, and developing new business models, such as sharing networks. Research around the 'Physical Internet' (PI) leads to shared standards for shipment sizes, greater modal connectivity, and IT requirements across carriers.

## 2. Start-up, shake-up

New entrants become significant players and take market share from the incumbents through new business models based on data analytics, blockchain, or other technologies. One or two become dominant in specific segments. Last-mile delivery becomes more fragmented, with crowd-delivery solutions gaining ground. These start-ups collaborate with incumbents and complement their service offers.



## 4. Scale matters

Incumbents increase efficiency by streamlining their operations and taking full advantage of new technology. They fund promising new technologies with venture capital cash, and attract new staff with critical skills and expertise in competition to create a dominant market position. Major players merge to extend their geographical scale and enhance their cross-modal coverage. Access to capital to fund these investments becomes increasingly important.

## 3. Complex competition

Big retail players expand their logistics offerings to fill their own needs and beyond, effectively moving from customers to competitors. They purchase small logistics players to help cover major markets, and draw on their deep understanding of customer behaviour to optimise supply chains. Technology firms who used to be suppliers to the industry enter the logistics arena too, offering logistics services and turning into competitors.

# 1. Sharing the PI(e)

Incumbents increase their efficiency and reduce their environmental impact by collaborating more, and developing new business models, such as sharing networks. Research around the 'Physical Internet' (PI) leads to shared standards for shipment sizes, greater modal connectivity and IT requirements across carriers.

## What's driving this scenario?

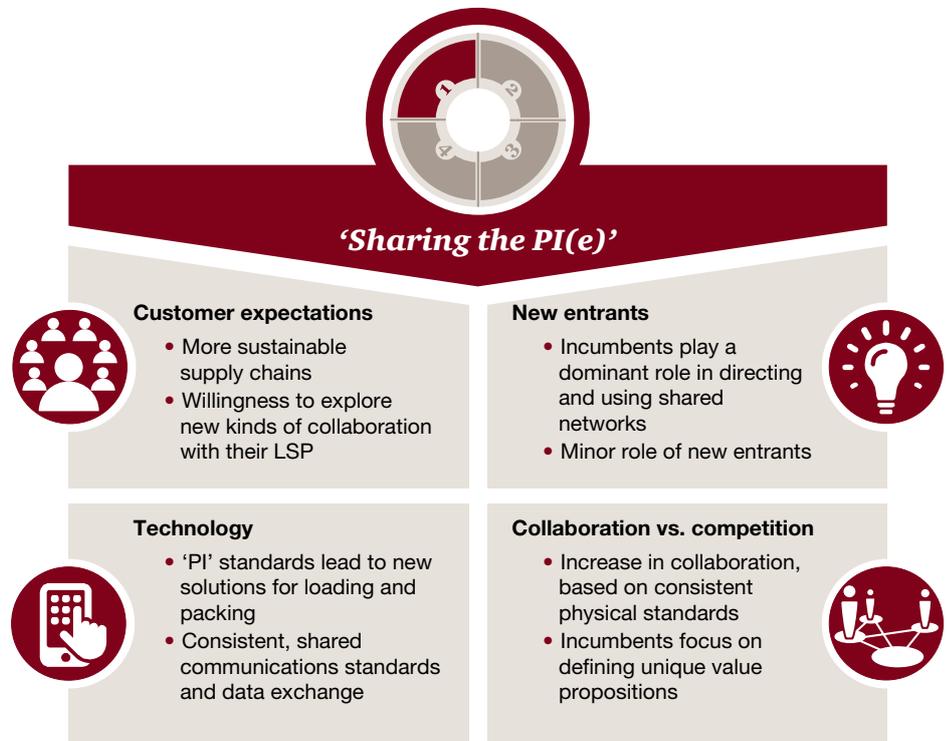
Several forces converge in this scenario. With customers demanding cheap, green and fast supply chains, the incumbent logistics companies look for ways to create unique value propositions. Some major industrial customers still want the comfort of dealing with one logistics partner, yet they look at new ways of partnering.

At the same time, new physical and digital standards emerge, most significantly in relation to the 'Physical Internet', making it easier for companies to share space within one container and to connect across transport networks. This is supported by more consistent standards for communication and data exchange. Governments also encourage greater vertical collaboration across the industry and fund initiatives such as EU-driven programmes to increase 'synchromodality' (connectivity between shipping modes and across shippers).<sup>22</sup>

## What are the implications for logistics companies?

As networks become more fully shared, CEP companies will focus their competitive edge on customer expectations. Companies which can build on a strong brand profit from improved margins, by partnering with other firms to cover less profitable delivery routes. National posts, on the other hand, may struggle as they are forced to cover these routes and lose volume in more profitable regions.

3PLs, 4PLs and freight forwarders begin to establish collaborative partnerships with major customers, who take over



ownership of some fleet assets. Sea freight and trucking companies are likely to benefit the most from the new 'PI' standards, which make it easier to fully use their capacity, and increased profitability is likely to reduce the pressure for consolidation in this sector. Warehousing will benefit from cost efficiencies too, as automated loading and picking systems based on 'PI' standards are implemented. Cybersecurity will be a crucial issue for companies that shift to new data standards and greater data sharing.

## What are the implications for customers?

Increased efficiency leads to lower costs for LSPs, and they have to decide how much of this benefit gets passed to their customers.

B2B customers may consider investing in transportation assets, and thereby secure superior service and rates from a trusted long-term partnership with their LSP. Usually, service levels and efficiency are higher in urban areas. Isolated rural communities are often served only by national posts with universal service obligations. The regional focus of CEP providers will enhance the service level for customers, especially in isolated areas along less profitable routes.

22 [http://www.etp-logistics.eu/?page\\_id=79](http://www.etp-logistics.eu/?page_id=79)

## 2. Start-up, shake-up

New entrants become significant players and take market share from the incumbents through new business models based on data analytics, blockchain, or other technologies. One or two become dominant in specific segments. Last-mile delivery becomes more fragmented, with crowd-delivery solutions gaining ground. These start-ups collaborate with incumbents and complement their service offers.

### What's driving this scenario?

Technological innovation and changing customer behaviour are key here. In the CEP space, start-ups take advantage of consumers' growing interest in the sharing economy to develop new crowd-sharing solutions, sometimes linked with car-sharing. E-marketplaces for transportation and logistics services emerge, targeting specific industry sectors with great success. Start-ups which began by offering individual apps in the freight, parcel or last-mile space also expand to become independent platforms, aggregating access to shippers and carriers. Logistics solutions based on blockchain technology are developed by start-ups and gain momentum in areas such as digitised trade documents, chain of custody, customs clearance, and trade finance.

### What are the implications for logistics companies?

Forwarding becomes more fragmented, as newly emerging 'hub specialists' begin to dominate specific legs of trade routes. In the contract logistics space, start-ups (including 4PL start-ups) complement and enhance the services provided by 3PLs, focusing on their most profitable customer segments. Operators in CEP have to compete with start-ups which may have a clear cost advantage if their people are independent contractors rather than employees. Transportation and logistics is among the top industries to replace labour with automation – but the time frames for implementation vary. Sortation and picking, for example, will be automated much quicker than last-mile delivery. Blockchain technology also fosters automation and efficiency through



its trustless peer-to-peer network, thereby reducing delays, human error, and transaction costs for interactions between supply chain partners – for example, in the processing of international trade documents.

### What are the implications for customers?

Industrial customers benefit from advanced logistics services based on high-end technology, provided by collaborating incumbent 3PLs and start-ups. Retail customers enjoy greater choice of last-mile providers, and lower delivery costs as a result. At the same time, service offers based on the sharing economy might result in lower

costs as well as lower service levels, though the idea is more likely to be accepted by B2C than B2B customers. Consumers who participate in crowd-sharing solutions earn extra cash for trips they take anyway. They have a high flexibility in how they can contribute to platform-based logistics solutions – with opportunities from a temporary part-time role all the way to a full-time job. Supply chains become more transparent, with blockchain-backed services offering easy authentication of shipments.

### 3. Complex competition

Big retail players expand their logistics offerings to fill their own needs and beyond, effectively moving from customers to competitors. They purchase small logistics players to help cover major markets, and draw on their deep understanding of customer behaviour to optimise supply chains. Technology firms who used to be suppliers to the industry enter the logistics arena too, offering logistics services and turning into competitors.

#### What's driving this scenario?

The competitive landscape changes markedly here. Online retailers expand their own logistics offerings. In some cases, this reduces their use of external providers, but doesn't replace it entirely. Others use their own sophisticated analysis of customer data to increase logistics efficiency substantially. In order to fully use their capacity, players like the large grocery chains and big-box retailers begin offering their own logistics services, and look to combine their bricks-and-mortar and online supply chains.

Suppliers to the industry may also enter the business of logistics operations. If warehousing solutions – using advanced robotics, drones and self-driving repositories – become more sophisticated, logistics service providers may no longer be able to provide staff with the right skills to operate these assets. Technology suppliers may offer logistics services based on their own particular expertise.

Manufacturing based on 3-d printing gains momentum and lowers the overall demand for transportation. To compensate, LSPs experiment with new business models, like developing 3-d printing hubs, 3-d printing capabilities at customers' sites, or offering platforms with 3-d blueprints. LSPs will thus become competitors to some of their customers.



#### What are the implications for logistics companies?

CEP companies face decreasing volumes, making it more difficult to fully use capacity. They also struggle to keep up with rapid advances from industry 'disruptors' operating primarily in the last mile. 3PLs may need to consider partnering with robotics companies to improve warehouse services. Some carriers shift from working with current incumbent CEP companies to emerging new competitors, but the net impact is essentially neutral.

#### What are the implications for customers?

Online retailers that start their own logistics operations reduce their dependence on LSPs, and gain a competitive edge over retailers that don't manage to do this. Further improvements in warehouse robotics and automation drive down logistics costs for industrial customers. Fierce competition among incumbents and new entrants drive down costs. Consumers will benefit by getting a better service from big online retailers who integrate their logistics activities.

## 4. Scale matters

*Incumbents increase efficiency by streamlining their operations and taking full advantage of new technology. They fund promising new technologies with venture capital cash, and attract new staff with critical skills and expertise in competition to create a dominant market position. Major players merge to extend their geographical scale and enhance their cross-modal coverage. Access to capital to fund these investments becomes increasingly important.*

### What's driving this scenario?

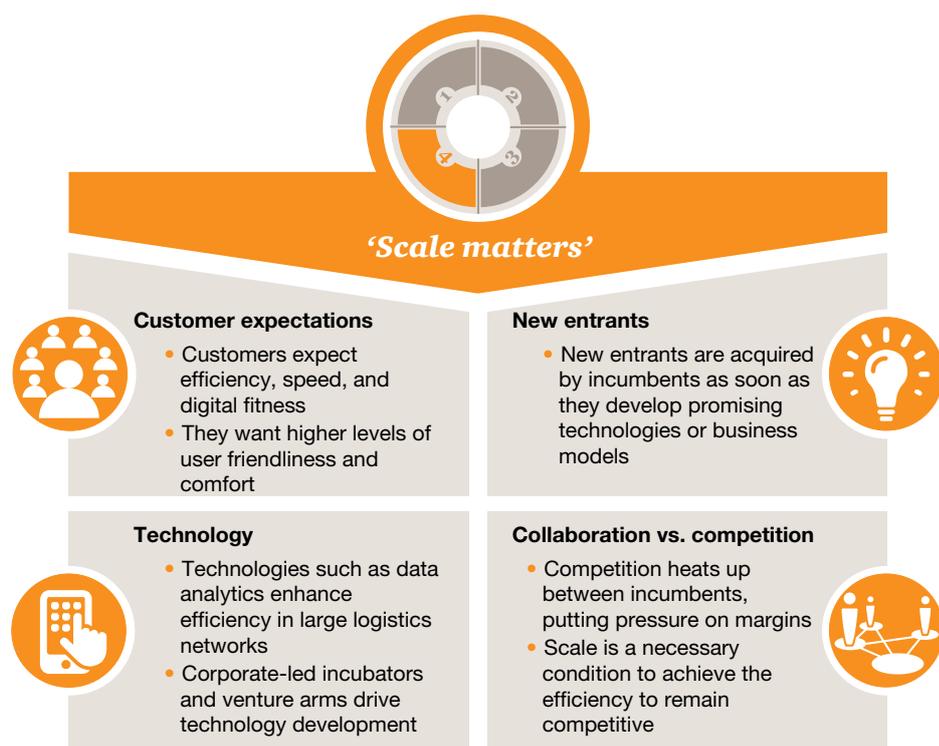
Technology continues to improve, but its development is dominated by incumbents' own research and their acquisitions of new entrants in specific technology areas. Network size and efficiency continue to be key sources of competitive advantage, and consolidation accelerates. The key to success in this model is buying the right start-ups at the right time: too early and they will be too speculative, too late and the price will be too high.

### What are the implications for logistics companies?

Access to capital becomes a key differentiating factor, both to drive in-house R&D and to fund efficiency-enhancing technologies such as data analytics, blockchain, and automation. Carriers look to establish dominant positions, accelerating M&A in the trucking and sea freight segments. CEP companies increase efficiency in the last mile by introducing new technologies like drones (for remote markets) serving both their B2B and B2C customers, striving for unique selling points in a highly competitive market.

### What are the implications for customers?

Customers benefit from the growing network size of LSPs, and gain better delivery speeds and efficiency, supported by new and more sophisticated technologies in delivery and customer interaction, thereby enhancing their user-friendliness and level of comfort.



## Leading through uncertainty

The basis for competitive advantage in the logistics industry is changing fundamentally. An established network may become a hindrance rather than an advantage. New technologies will change the industry's cost model and call existing business models into question. And there may well be new approaches to dynamic pricing that take capacity utilisation more fully into account.

Although the core needs of most customers have changed very little, customer expectations are increasing greatly, whether those customers are consumers shipping packages or OEMs partnering with an LSP on the production line.

In the futures we have described, can a logistics company meet the growing expectations of customers, remain profitable and generate growth? The short answer is yes. But it's not going to be simple or easy.

Whatever industry segment a T&L company operates in, it will be crucial to **commit to an identity** and develop a clear strategy to fulfil this, focusing only on markets where they believe they have a 'right to win'. Companies need to ask themselves whether they have the distinctive capabilities they need to compete. If not, can they develop these capabilities, use collaboration to succeed, or should they withdraw from certain elements of their business?

Logistics companies will need to focus on 'digital fitness', cost efficiency, asset productivity, and innovation if they want to meet changing expectations. Building and refining these and other capabilities, and then bringing them to scale across the enterprise, will be key as they **translate the strategic into the everyday**.

Change in the competitive environment puts a company's culture to the test – especially in a mature industry like logistics, where it can be tough to change, even when traditional 'ways to play' are being fundamentally changed or even replaced. T&L companies need to be ready for this change, and the successful companies will be those with agile and flexible cultures that make it easier for people to work together across internal boundaries. You need to **put your culture to work**.

Logistics companies also need to bring costs down; but not only for the sake of efficiency. They also need to prune what doesn't matter and thus free up resources for the key areas of focus – such as digitisation, asset productivity, and innovation – and invest more to support the company's key capabilities and value propositions. So, '**cutting costs to grow stronger**' should be seen as something closely related to strategy.

Finally, with more disruption ahead, companies need to anticipate how their capabilities will need to evolve. The best will develop services and solutions that will create demand instead of just following it. To do this, T&L companies need to establish strong relationships with key customers, have an ear on the markets they target, and actively **shape the future**.

The above describes our concept of 'five key acts of unconventional leadership' that drive success by aligning distinctive capabilities with business strategy, and applying them consistently. This approach, defined in our recent book, *Strategy that Works*, spans the entire business, from developing the business model through to daily operations.

In this paper we've taken a broad perspective. It gives hints on some ways the industry might develop, but you will want to consider the detailed implications for your specific business and operating model. Going forward, we will reflect further on how these scenarios may play out differently around the world as well as up, down and across the value chain, and supplement this broad overview with deep-dive perspectives in specific areas.

---

## Learn more

### Authors

**Andrew Tipping**, Strategy& US  
[andrew.tipping@strategyand.pwc.com](mailto:andrew.tipping@strategyand.pwc.com)

**Peter Kauschke**, PwC Germany  
[peter.kauschke@de.pwc.com](mailto:peter.kauschke@de.pwc.com)

### Contributors

**Andrew Schmahl**, Strategy& US  
[andrew.schmahl@strategyand.pwc.com](mailto:andrew.schmahl@strategyand.pwc.com)

**Dietmar Prümm**, PwC Germany  
[dietmar.pruemm@de.pwc.com](mailto:dietmar.pruemm@de.pwc.com)

**Dominik Baumeister**, Strategy& Australia/Asia  
[dominik.baumeister@strategyand.pwc.com](mailto:dominik.baumeister@strategyand.pwc.com)

**Euan Cameron**, PwC UK  
[euan.cameron@uk.pwc.com](mailto:euan.cameron@uk.pwc.com)

**Jan Willem Velthuijsen**, PwC Netherlands  
[jan.willem.velthuijsen@nl.pwc.com](mailto:jan.willem.velthuijsen@nl.pwc.com)

**Julian Smith**, PwC Indonesia  
[julian.smith@id.pwc.com](mailto:julian.smith@id.pwc.com)

**Marc Engel**, PwC Netherlands  
[marc.engel@nl.pwc.com](mailto:marc.engel@nl.pwc.com)

**Michal Mazur**, PwC Central and Eastern Europe  
[michal.mazur@pl.pwc.com](mailto:michal.mazur@pl.pwc.com)

**Nigel Cinnamon**, PwC UK  
[nigel.cinnamon@uk.pwc.com](mailto:nigel.cinnamon@uk.pwc.com)

**Stefan Stroh**, Strategy& Germany  
[stefan.stroh@strategyand.pwc.com](mailto:stefan.stroh@strategyand.pwc.com)

**Ulrich Koegler**, Strategy& United Arab Emirates  
[ulrich.koegler@strategyand.pwc.com](mailto:ulrich.koegler@strategyand.pwc.com)

### Editorial and research team

**Anita Hagen**, PwC Netherlands  
[anita.hagen@nl.pwc.com](mailto:anita.hagen@nl.pwc.com)

**Elizabeth Montgomery**, PwC Germany  
[elizabeth.montgomery@de.pwc.com](mailto:elizabeth.montgomery@de.pwc.com)

**Hendrik Lemke**, PwC Germany  
[hendrik.lemke@de.pwc.com](mailto:hendrik.lemke@de.pwc.com)

### Further reading on the transportation and logistics sector

*2016 Commercial Transportation Trends – Strategies freight carriers can use to defeat disruptors*

*19th Annual Global CEO Survey: Transportation and logistics industry key findings*

*Industry 4.0: Building the Digital Enterprise – Transportation and logistics key findings*

*Intersections: Quarterly analysis of M&A in the global transportation & logistics industry*

*Transformation & logistics 2030 – A series of Delphi studies*

### Further reading on industry transformation

*Strategy that works – How winning companies close the strategy-to-execution gap?*

*New energy futures: perspectives on the transformation of the oil and gas sector*

*The road ahead: gaining momentum from energy transformation*

*Re-inventing the wheel: scenarios for the transformation of the automotive industry*

*Glimpsing the future(s): Transformation in the chemicals industry*

### Further reading on technologies

*Clarity from above – PwC global report on the commercial applications of drone technology*

*PwC's Global Data and Analytics Survey 2016: Big Decisions*

*Navigating cloud management*

*Organize your future with robotics process automation*

*Blockchain and smart contract automation: Why are blockchains important?*

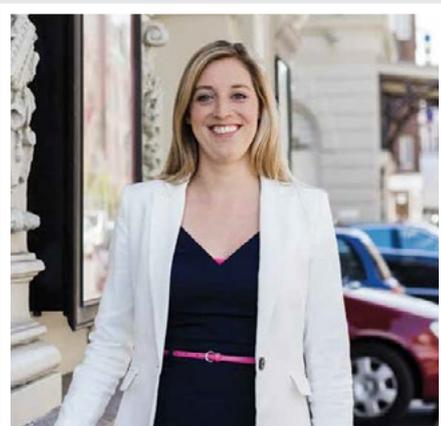
*2015 Commercial Transportation Trends – Things are going so well for freight firms that it's time to start worrying about the next real danger to the industry: 3D printing.*

*Connected Car Study 2015: Racing ahead with autonomous cars and digital innovation*

When we look into the future, we see disruption, we see collisions, we see transformation, but most of all we see opportunities.

What do you see when you look to the future?

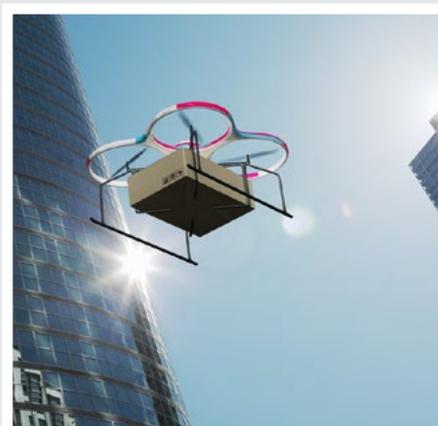
Other titles available in the future in sight series



***Re-inventing the wheel***  
Scenarios for the transformation of the automotive industry

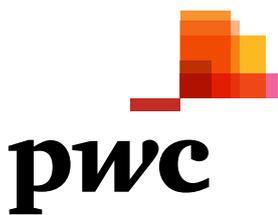


***Glimpsing the future(s)***  
Transformation in the chemicals industry



***Tech breakthroughs megatrend***  
How to prepare for the technological breakthroughs megatrend, and the eight technologies to start with

[www.pwc.com/futureinsight](http://www.pwc.com/futureinsight)



This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (express or implied) is given as to the accuracy or completeness of the information contained in this publication, and, to the extent permitted by law, PwC does not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this publication or for any decision based on it.

© 2016 PwC. All rights reserved. PwC refers to the PwC network and/or one or more of its member firms, each of which is a separate legal entity. Please see [www.pwc.com/structure](http://www.pwc.com/structure) for further details.