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# Global Supply Chains in 2025: Industrial Internet, Next-Gen Logistics & Space Tech

**A Tradeshift Report on the Future of Supply Chain Management**

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The new technology revolution is sweeping through all corners of civilization. In its path lie deceased Fortune 500 incumbents disrupted by digital-fluent competitors, the specter of mass worker displacement as artificial intelligence and robotics replace humans in industries such as manufacturing and transportation, and business that is increasingly defined by computer code and algorithms. Mixed in with this upheaval is the opportunity for digital reinvention and smarter commerce. Greater trade democratization combined with new sustainable business models can have the power to distribute prosperity to a wider population and keep the global economy healthy. The backbone for all of this potential is the supply chain.

To grasp and harness the speed and breadth of the staggering confluence of new technologies, business leaders with a stake in their supply chains should by now have a practice of assessing “industry 4.0” innovations, which are transforming the physical and digital aspects of their sourcing, procurement, production, logistics, transportation, and delivery operations.

The list of industry 4.0 technologies is long, but at the core they’re all enabled by exponential growth in computing power and data, as well as the hyper-connectedness of people and machines. By 2022, the World Economic Forum predicts that over 1 trillion sensors will be connected online. The implications transcend the imagination.

In this report, we’ll cover the key industry 4.0 technologies like the industrial internet and next-generation transportation technologies that are poised to seriously impact the speed, risk, intelligence, and overall effectiveness of supply chains. We’ll also add a dark horse - space tech.

## Industrial Internet

The industrial internet is often referred to as the industrial internet of things (IIoT), and is technically the plumbing for the internet of things (IoT). Think Amazon Echo and wearables on an industrial scale. Nowadays, while all three buzzwords are used interchangeably, IoT encompasses the broader trend of increasing interconnectedness between people and hardware. IIoT, on the other hand, refers to the machine-to-machine communications and sensor data. Since they overlap, we’ll look at both, and like the Industrial Internet Consortium, will use the umbrella term, industrial internet.

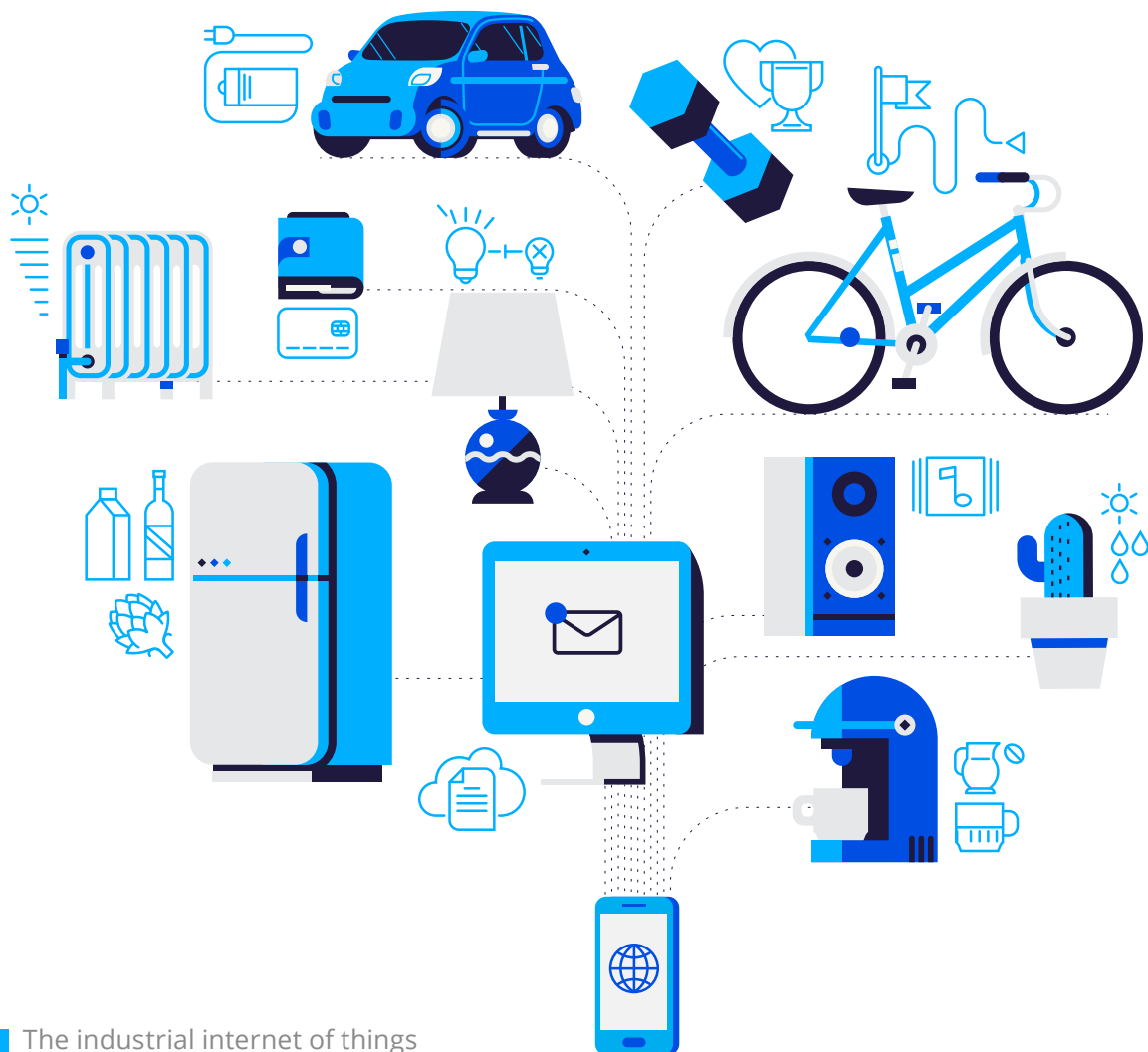
The Industrial Internet will transform supply chains through intelligent, interconnected objects that will unleash performance gains, lower operating costs and increase reliability. According to a survey by Supply Chain Insights LLC, Global Summit Survey 2015, 44% of 57 respondents polled indicate that the Internet of Things will have the greatest impact on supply chain effectiveness by the year 2025, compared with 26% for 3D printing, 14% for robotics, 9% for advanced analytics, and 7% for social application platforms. Similarly, a 2016 Accenture study, Growing the Digital Business: Spotlight on the Internet of Things, found that nearly nine out of ten enterprises believe the IoT will improve their supply chain in the next three years.

Why are supply chain leaders so bullish on IoT/industrial internet? The answer is the transformative

potential to rethink supply chains entirely. No longer are supply chains linear processes where cost cutting is the name of the game. They are becoming highly networked, scalable, and rapid to adjust for changing demands. Today, customers want products faster and they want them customized. At the same time, supply chains are global, longer, and, in turn, exposed to more risk. In response, companies are changing the way they're operated and managed. Those with innovation expertise are winning by increasing sales, not just reducing costs.

For example, retailers that have embraced the industrial internet for their omnichannel operations and track their inventory with RFID chips can better serve their customers through options such as "ship from store," "click and collect" (allows customers to order a product online and pick it up at a local store), and "endless aisle" technology, which enables customers to order products that are out of stock in their local store, but are available in another outlet elsewhere in the country.

**The key to enabling these new customer-centric offerings is real-time data. Data is what drives the pervasive visibility from the point of manufacture to the point of delivery that makes it all possible.**



■ The industrial internet of things

Manufacturers are adopting the industrial internet to respond faster to changing demands by using technology like 3D printers to change the economics of how parts are made. Some even enable different points along supply chains to make the parts themselves via shareable digital product plans in response to disruptions, such as natural disasters.

Similarly, advanced, digitally-connected manufacturing methods are ushering in mass personalization at scale, which is the ability to deliver the right product to the right person at the right time and in the right form factor.

In Davos, during the 2017 World Economic Forum Annual Gathering, Tradeshift CEO and co-founder, Christian Lanng told Ray Wang, Principal Analyst, Founder, and Chairman of Silicon Valley-based Constellation Research, Inc., that supply chains are becoming much more distributed, much more local, and on demand. "10 years ago, the unit price of producing 1,000,000 shoes was 100x cheaper than producing 1,000 shoes. Today, with new advanced production methods, robotics, and additive manufacturing, the variable costs of producing a small batch of shoes are roughly the same as a large one. We can produce goods along the timeline we need and where we need it."

The impact of the industrial internet in supply chains stretches even further as devices, products, tools, and the equipment used to produce them contain interconnected technology embedded in them. According to Gartner, product innovation platforms will surface to address the way things are manufactured, from the definition and design of products to the management of their lifecycles.



■ Tradeshift CEO and co-founder, Christian Lanng with Ray Wang, Principal Analyst, Founder, and Chairman of Silicon Valley-based Constellation Research, Inc.

## Next-generation Transportation and Logistics

While in the US, high-speed “bullet” train technology has yet to go mainstream, other parts of the world are moving ahead with investments in rail to support greater trade between far-flung regions. China’s new Silk Road, for instance, has already seen \$1 trillion invested into the project in an effort to increase cross-border trade to \$2.5 billion, according to the World Economic Forum. Also known as “ One Belt One Road,” the networked infrastructure will span over 60 countries and use both land and sea routes.

Transporting cargo across the vast distances of the new Silk Road will call for more extreme means to collapse time and distance. One alternative is Hyperloop, a pod and tube concept that promises to move passengers and cargo at airline speeds at a fraction of the cost of air travel. Hyperloop One is one of a few companies leading the effort. It has recently partnered with a Russian firm to bring Hyperloop technology to the new Silk Road, which could reduce the shipping time from China to the Mediterranean from days to hours. The last time shipping times were reduced that drastically was the switch from sails to steam.

The initial use cases for transporting freight using Hyperloop focus on goods where speed is paramount and where 3D-printed manufacturing can’t help.



■ “Currently, 15% of the freight market places a premium on speed, such as frozen goods - below 40 degrees - and flowers and human organs,” said Bibop Gresta, Chairman and Co-Founder of Hyperloop Transportation Technologies, another player in the emerging space.

Gresta, who spoke at the Tradeshift Sanctuary in Davos again in 2017 after a star turn in 2016, pointed out that although Hyperloop is chiefly for transporting people over land at roughly the speed of sound, freight also has a naturally fit. “Freight is a consequence of a well-designed system, because the system we designed is compatible with the existing forty foot (40x8x8 feet) or twenty-foot (20x8x8 feet) container that is the standard in the market.”

Beyond rails and tubes, there’s also transportation innovation taking place on highways. Companies like Otto and Volvo are developing self-driving vehicles like big rigs that can transport goods thousands of miles without the need of a human at the wheel until they exit onto city

streets. Otto, which is owned by Uber, made its first delivery late last year - 50,000 cans of Budweiser across Colorado. And last Spring, about a dozen trucks completed a weeklong voyage of almost total autonomous driving across Europe, the first such pilot test on that continent.



■ Credit: Scania

As commercial uses for autonomous vehicles grow, early adopters in the supply chain can stand to gain efficiencies due to lowered fuel costs, greater delivery flexibility, less accidents attributable to human error, and reduced congestion. Combined with sensor data like temperature, RFID, and GPS streaming from these vehicles, supply chain managers can automate ordering of inventory while self-diagnostics can identify failing components, resulting in automated parts ordering.

Drone aircraft are also poised to become everyday sightings. Building on proof of concepts by innovators like Amazon and DHL, innovation is now at full-throttle as the FAA begins to relax some rules about no flying beyond the operator's line of sight, over people, and at night. Last fall, Pilots for Project Wing, an Alphabet company (Google), tested drone delivery of burritos from Chipotle at Virginia Tech using multiple drones in a closed area. Among the objectives, is to help develop a low-altitude air traffic system that can maintain order as the skies become more crowded with unmanned aerial vehicles (UAVs).

Third-party logistics companies are excited to use drones for product delivery but given the hurdles, few will be able to execute anytime soon. Nonetheless, the advantages for the last mile delivery are well understood.

The greater supply chain opportunity for drones may be indoor, such as in warehouses and distribution centers, as explained in a related Tradeshift report, [Navigating the Technological Disruption of Shipping and Logistics](#). Drones will alert warehouse managers to low supplies or faulty storage conditions, as well as manually fetch goods significantly faster than their human counterparts.

Supply chain executives should consider drones, robots, etc. as additional interfaces to the cloud. The information gathered from these IoT-endpoints should be stored in a way that it opens for third parties to process it, since, as Tradeshift co-founder and CTO, Gert Sylvest says, "Nobody is able to crack the 'big data' challenges on their own, and to source reliable machine learning training sets from the real world you need to federate the data sets to increase the likelihood of deriving value from the data."

That value comes in the form of connecting all industry 4.0 data to create insights across inventory, logistics, and procurement systems to enable automated decision-making downstream that is first predictive, then prescriptive, before reaching the ultimate "cognitive" state. As Tradeshift CEO and co-founder, Christian Lanng, said at an HSBC Summit in London last fall, "Data is only useful when it is connected."

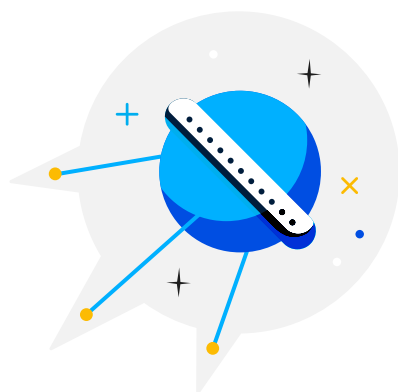
## Space Tech

Moving higher up the atmosphere and beyond, space technology can also provide new perspective and information that can help shape sustainable and smart supply chains in the future.

Consider the growth of microsatellites launched into space. According to Wired Magazine, from 2008 to 2016, there were 730 launches. In the period from 2017 to 2025, that number is expected to rise to 2,460. The primary drivers are lowering costs and miniaturization.

Speaking at the Tradeshift Sanctuary in Davos this year, CEO and Co-founder of Planet, Will Marshall, said that the sudden decrease in the cost of sending payloads into orbit is a driver for the space boom. Another trend is the miniaturization of technology. "It is incredible how fast changes are happening in the space industry. I have been in the industry for many years and a lot was not changing for a couple of decades, and suddenly a lot of things are taking off. And I think the majority of it is driven by the miniaturization of technology," he said.

Space exploration has been one of the most disruptive forces in terms of contributions to the technology world with many business cases now supporting the burgeoning private sector. The global imaging capabilities pioneered by Planet, for instance, can help leaders make informed decisions faster with up-to-date data by monitoring global crop yields, mine outputs, port traffic and more.



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Furthermore, satellite technology is also transportation logistics in other ways, such as picking up tracking in areas with low or non-existent cellular coverage. The shipping container industry, for example, can use a dual-mode system to help automate container identification, cargo monitoring, and security alerting in virtually all locations. This connectivity enables full 24/7 tracking of valuable assets, a feature increasingly in demand or mandated by regulations.

## Conclusion

By 2025, the global supply chain will mature as a vast network of interconnected companies, processes, and data flows that will support new business designs and models that will threaten the status quo for many incumbent industry leaders. The industrial internet will help bring disparate processes from procurement through to manufacturing, transportation to final delivery, under greater control and visibility.

By that year, according to the World Economic Forum, the implementation of digital platforms that enable cross-border trade and crowdsourcing of logistics routes could together create up to four million jobs, which is equivalent to a net 8.4% increase in the number of people employed in the industry today. The Forum, also points out the sobering aspect of this shift: "The adoption of newer delivery capabilities such as drones, autonomous trucks and shared warehouses means that many existing logistics jobs will be put at risk."

On top of integrating industry 4.0, supply chain and procurement leaders will also need to redistribute roles and responsibilities between humans and machines, taking the right cues and best practices from across industries as they too evolve alongside the fourth industrial revolution.



## How Tradeshift can connect you digitally to a new world of commerce

The future of business belongs to companies that are able to adapt to the accelerated change in sourcing, production and distribution that we are witnessing today. By focusing on the fundamentals of business processes — collaboration, transactions and relationships — and bringing these interactions into the cloud in digital form, we believe that businesses can overcome the traditional challenges of enterprise software.

These challenges include introducing digital processes between companies, bridging cloud and on-premise, connecting processes across application silos, and bringing relevant data into the hands of decision makers in real time. With Tradeshift you can build the foundation for providing the data needed to drive innovation in the supply chain and adopt new technologies faster and more successfully than your competitors.

### **About Tradeshift**

Founded in 2010, Tradeshift is the world's largest business commerce platform that connects buyers and sellers. Tradeshift connects over 1.5 million companies across 190 countries, processes over half a trillion USD in transaction value yearly, and has a marketplace containing 28 million SKUs. It offers solutions for procure to pay, supplier engagement and financial services, and enables companies and partners to build custom or commercial apps on its business commerce platform. Tradeshift is headquartered in San Francisco, with offices in Copenhagen, New York, London, Paris, Suzhou, Chongqing, Tokyo, Munich, Sydney, and Bucharest.