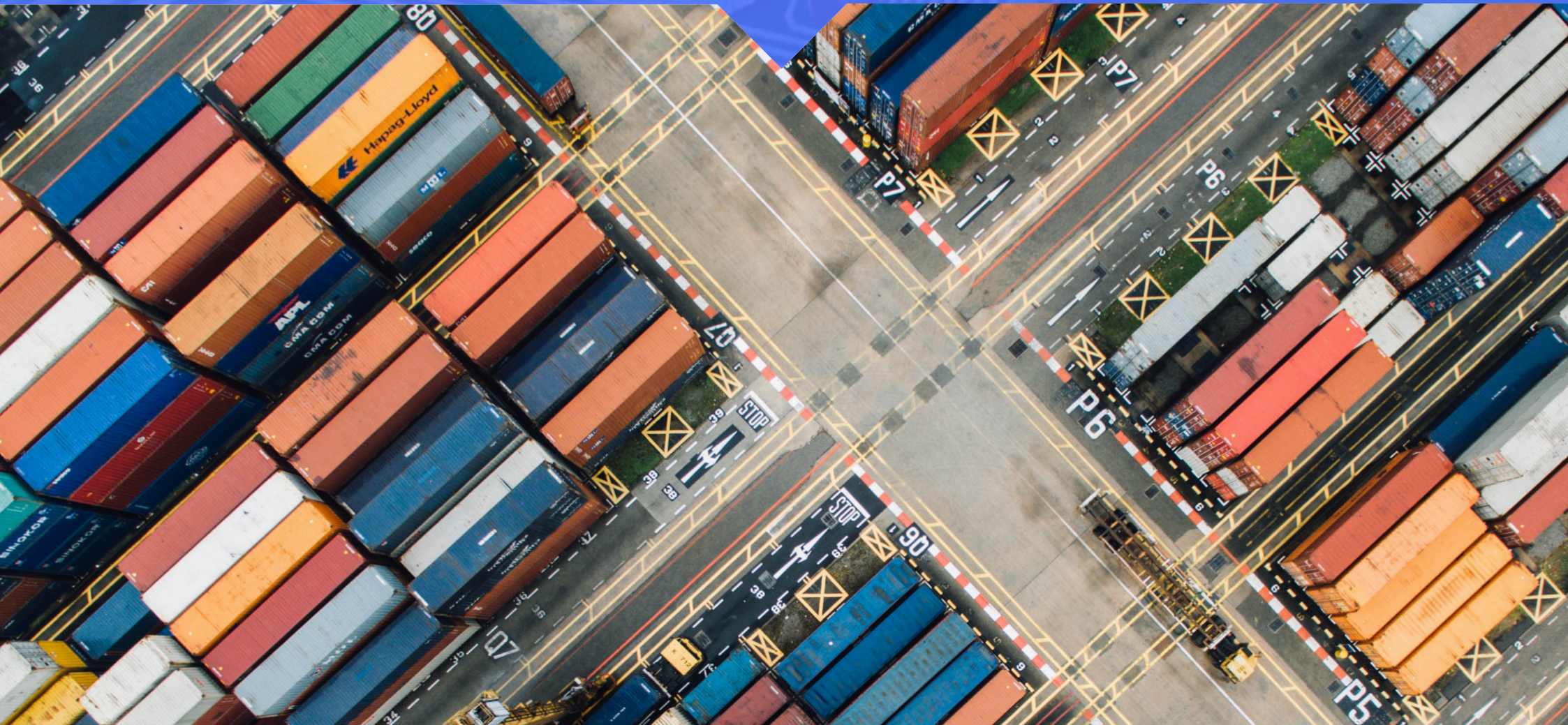


The State of Logistics Technology Report

2019



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Introduction

The logistics industry continues to undergo an exciting process of technology driven transformation. Bolstered by a plethora of improvements in deep learning and data analysis, distributed systems infrastructure and cybersecurity practices, the logistics space has begun to develop into a dynamic and fertile environment with a driving role in the global digital revolution. But there is still much work to be done. Investment in strategic technologies show companies thinking ahead, looking towards more collaborative methods of doing business and rapidly embracing working practices across the industry.

As always, the customer reigns supreme. Companies are meeting their needs more than ever, ploughing towards ensuring full-freight visibility across the supply-chain. CIOs have begun to occupy a front of house role, shaping the trajectory of the business in line with existing goals and new technologies. As the move towards the digital supply chain ramps up, we see industry leaders establishing a framework for Industry 4.0 which will modernise all aspects of the logistics industry.

This report is made up of expert insights from over 500 industry professionals, from predominantly North American based individuals, with 47% of respondents working at logistics service providers (3PL, 4PL, trucking, ocean, freight), 33% at technology solution providers, and 20% at shippers (retailers/manufacturers). This year's report includes in-depth remarks from:

- Curt Stoelting, CEO, Roadrunner Transportation Systems
- Greg Carter, CTO, GlobalTranz
- Peter Gibbons, CEO, TireHub
- Stephen Pratt, CEO, Noodle.ai

Presented here is an overview of the trends they highlighted in response to our questions.

502

Industry Professionals

236

Logistics Service Providers

165

Solution Providers

101

Shippers

Innovation Strategy

Continuing the trend from 2018, the bulk of investment is maintained across four key areas: business intelligence, transportation management, warehouse management, and supply chain visibility. Iterating across prior implementations and strengthening previous commitments in these four areas is the theme for 2019. Indeed, attempts to offer full visibility across the supply chain – especially via the introduction of blockchain - require sustained expenditure alongside already high research outlays. In an industry notorious for low margins the appetite for risk is low. As such, companies are opting to build on existing lines of investment.

Visibility continues to be the word on every modern logistics service providers' lips. This area continues to receive a large proportion of overall investment. Firms are hoping that automating transportation processes and developing scalable infrastructure will help to: cut down on lead times, improve on arrival estimates and allow 3PLs and shippers to connect seamlessly to manage commitments across global networks.

Transportation management goes hand in hand with the push towards increased visibility. Service providers spending on robust transport management and execution systems will find themselves set for a reduction in freight costs, more granular access to last-mile delivery data and asset-tracking across complex distribution networks. This is largely driven by the global e-commerce boom that has rendered last-mile visibility and parcel execution data a must for customers.

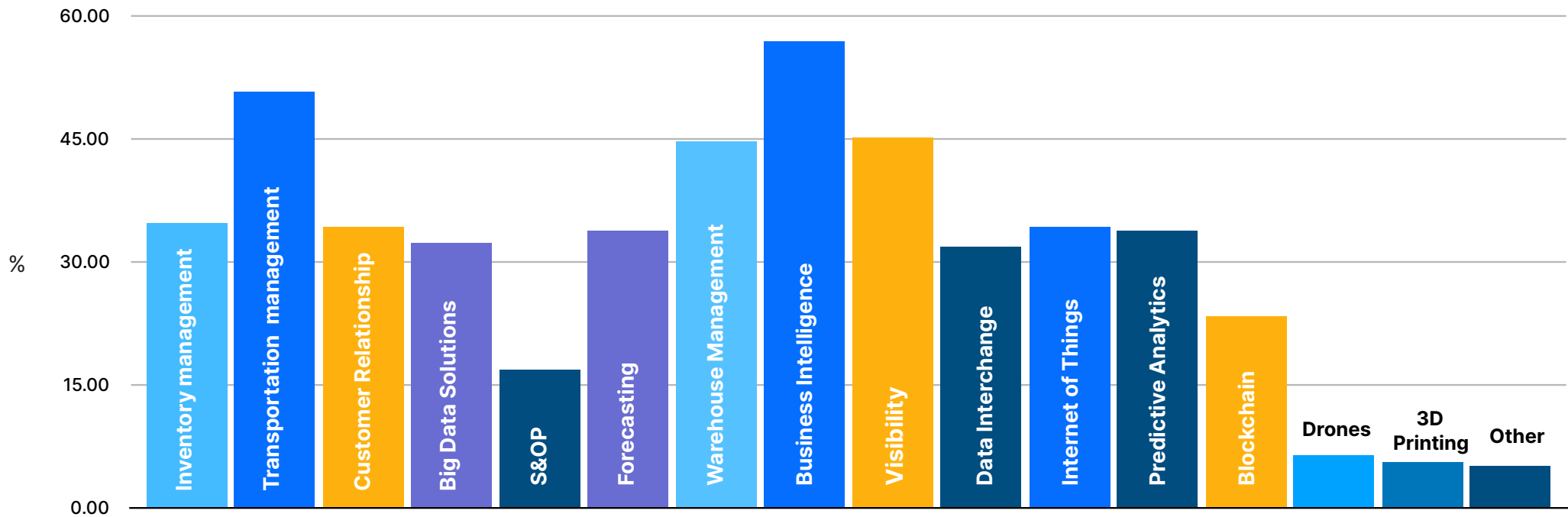
As a result, companies are still investing in intelligence - retooling internal predictive operations to provide promising and actionable business insights as the move from chain to network renders forecasting and decision-making ever more complex.

Visibility is getting to be more and more important, we're all used to being able to look at an app and know what's going on. It's now a key requirement. The freight doesn't have to move the fastest to meet the customers needs, but it has to move in a reliable fashion. They have to know where it is and have the visibility – the ability to know what's going on - so if something is going wrong they can work with us to make other arrangements.

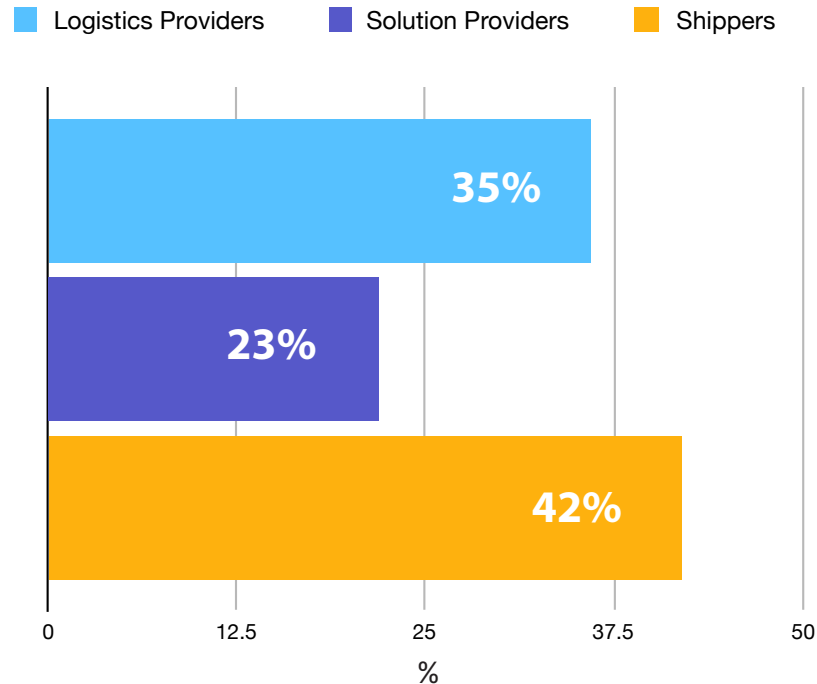
Curt Stoelting
CEO, Roadrunner Transportation Systems



What technologies are you looking to invest in over the next 12 months?



Who's driving the need for innovation in logistics technology?



With continuously evolving and hastening consumer expectations it's no surprise that shippers were deemed to be the clear drivers of innovation in this market. Under pressure in a market becoming more accustomed to immediacy, shippers have had to continue to evolve their supply chains to stay competitive. Innovation within logistics has become a business driver.

Does your IT department engage directly with customers when developing or implementing customer-facing IT?

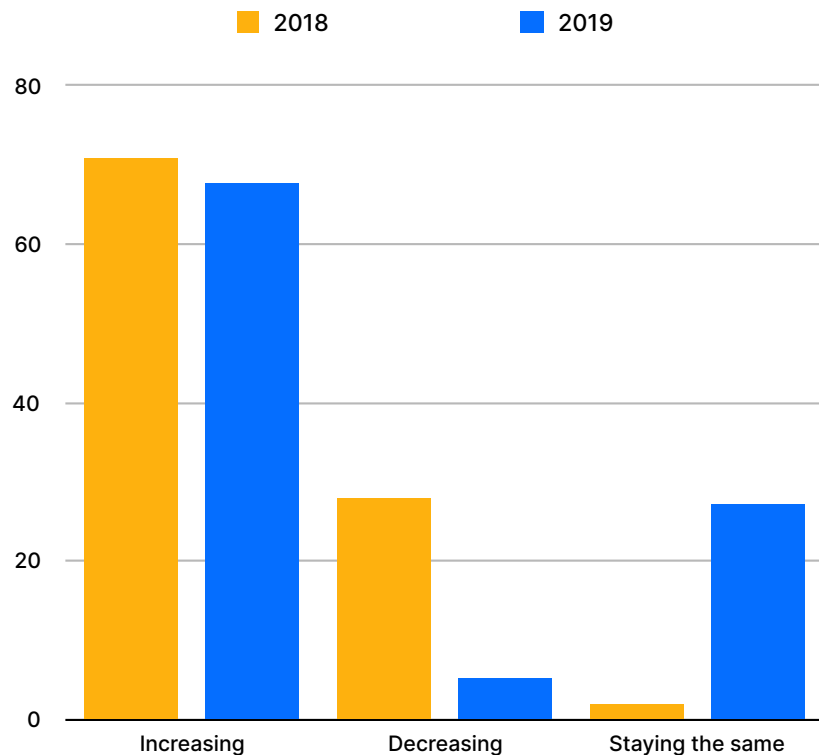
For logistics service providers, although 30% of respondents told us that their IT department still has no outward-facing role, the majority (48%) of IT departments will engage with the customer at least once in the development process. Almost half of all replies stated that they continuously interface with customers to manage development and to ensure that implementation goes smoothly; with 20% working with customers at the start of the process to ensure a smooth realization. As IT remains a critical part of the modern logistics company, it is imperative that this practice is maintained and that the IT department is not siloed, and able to work collaboratively with other parts of the business (marketing, sales, operations etc.)

Shippers are increasingly seeking the services of 3PLs to provide the technology, services and solutions. They need to provide lower prices, an "endless aisle" of product options, fast, nearly "free" shipping, and greater visibility to shipments in transit that consumers demand.

Greg Carter
CTO, GlobalTranz



Are you increasing or decreasing your IT spend?

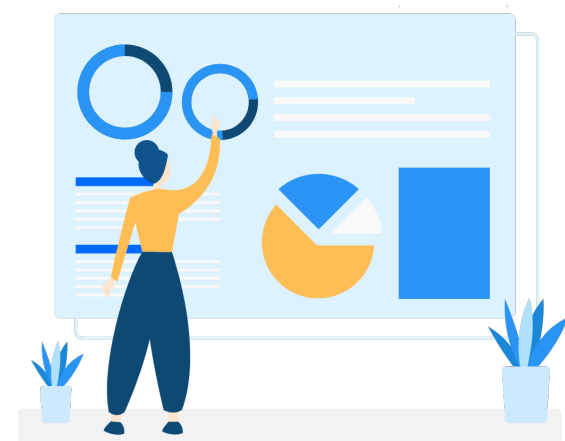


Year-on-year, IT departments in logistics service providers are seeing a healthy proportion of annual budgets being allocated towards their needs. As companies push ahead in upgrading technical infrastructure and moving away from legacy systems this trend will continue. Almost 70% of firms are still increasing their spending on IT, with only less than 10% now cutting back, opting to continue the funding allocated in 2018, a trend that is bound to continue as the industry accelerates the process of digitization.

What is primarily driving your increased spending?

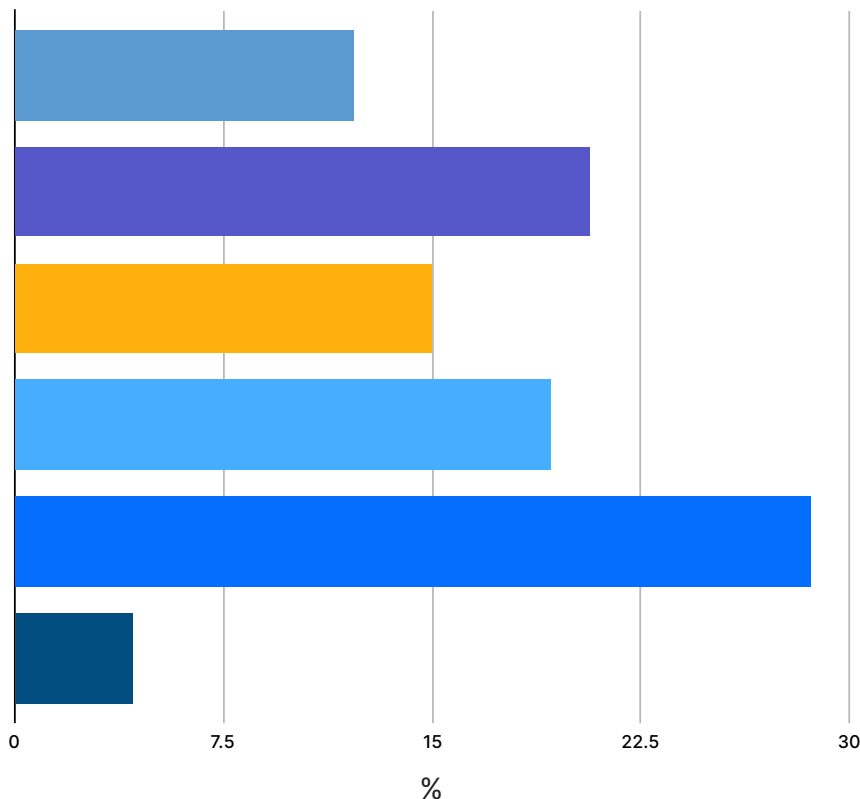
For 28% of logistics service providers (see overleaf) differentiation is still a major force behind business spending; as the market becomes more and more saturated with companies offering similar tech-based solutions, businesses are spending heavily to distinguish themselves. Customers require a salient point of difference to be incentivized to opt for one over the other and are increasingly demanding as a result.

Customer demands have spiked from 9.5% in 2018 to over 20% in 2019, buoying the adoption of new technology and aiding in the retirement of legacy systems as companies vie for contracts. The transition towards a modern stack is, however, easier said than done. With many organizations struggling to manage the impulse for innovation that is driving the industry it will be the companies that successfully navigate this period by opting for considered investment over novel experimentation that will thrive in the long-run.



What is primarily driving your increased spending?

- Keeping pace with the competition
- Updating legacy systems
- Creating a differentiator for our business
- Taking advantage of new technology
- Customer demands
- Other



How involved are IT executives in your company's sales process?

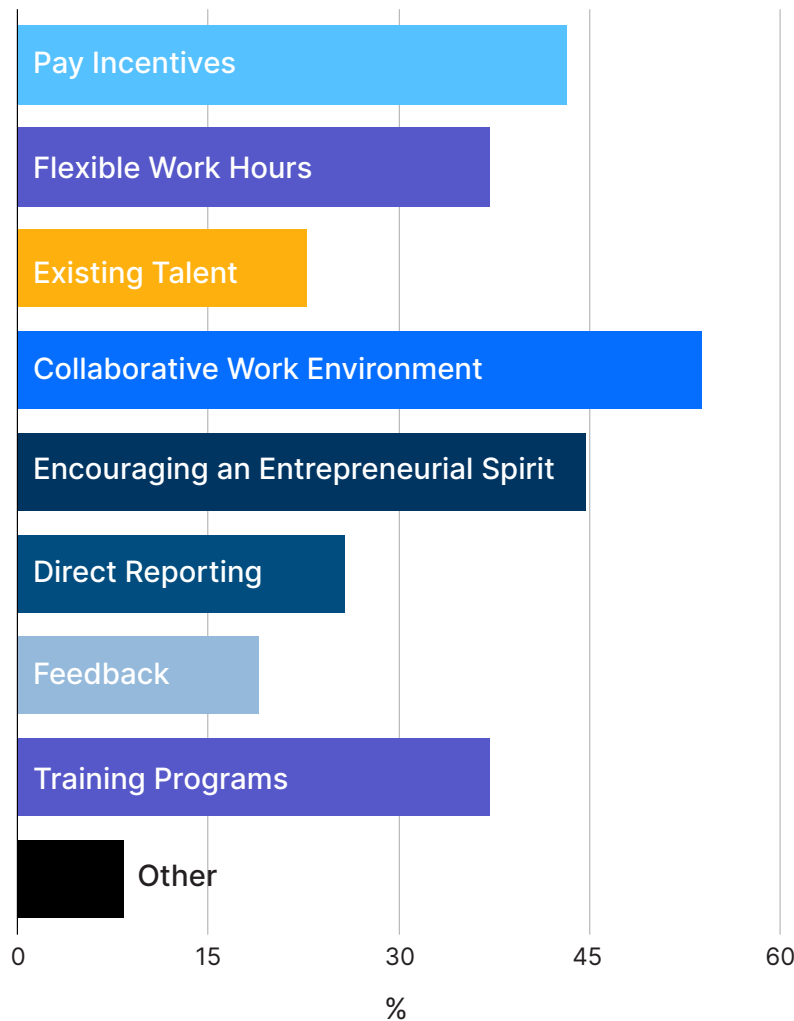
IT executives within logistics service providers play a prominent role in the sales process, despite almost 15% of firms scaling back their involvement. Whilst the logistics industry leans on their expertise in navigating Industry 4.0, some respondents (25%) have yet to find a place for IT executives in their day-to-day sales processes. The majority of firms surveyed have, however, found a place for their IT executives in the sales process and increasingly involve them, especially as 3PLs begin to integrate software systems into their packages.

Is your company actively assessing logistics start-ups and judging the possibility of a partnership or acquisition?

With a groundswell of interest in start-ups in the logistics community, it is no surprise that 63% of all service providers responding to our survey were interested in acquiring or partnering with a logistics start-up, along with 63% of solutions providers. Whilst these figures are consonant with last year's results, 60% of shippers have responded that they're not looking reach out for partnerships or acquire any new talent, preferring to allocate budgets to improve internal operations. Firms are looking to start-ups and early-stage teams for pilot programs that will pave the way for greater integration into a supply network with a digital core. This is especially evident now that regulatory frameworks such as the ELD mandate have now been ratified and companies can properly appraise their potential.

Talent

How are you attracting top technology talent to your organization?



Offering a collaborative environment remains the most effective way to attract talented employees to the logistics space. Slowly but surely the industry is shedding the reputation it has developed over the years and looks to be more dynamic and exciting for top developers, data scientists and engineers.

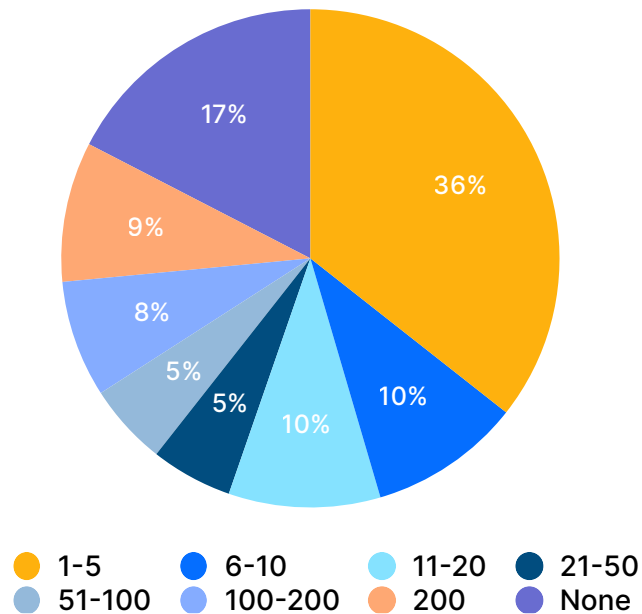
In addition, value-added incentives in the form of generous salary packages and robust training programs have proved to be successful. Fostering an entrepreneurial spirit within new additions also aids in ensuring they remain excited by the prospect of bringing something new to the industry, and can make it easier for companies to spend on early-stage startups to help build their technology stack with a view to the future.

We go to a lot of trouble to hire people who truly fit into what we're trying to do, and then we're very strong at onboarding ensuring people get a great chance to settle into the company. At a business like ours, starting up from scratch, having better talent than other people, looking after that talent, believing that people are the solution to what we're trying to do is critical to everything that we're doing these days. Talent is probably our number one focus.

Peter Gibbons
CEO, TireHub



How many data scientists does your company employ?



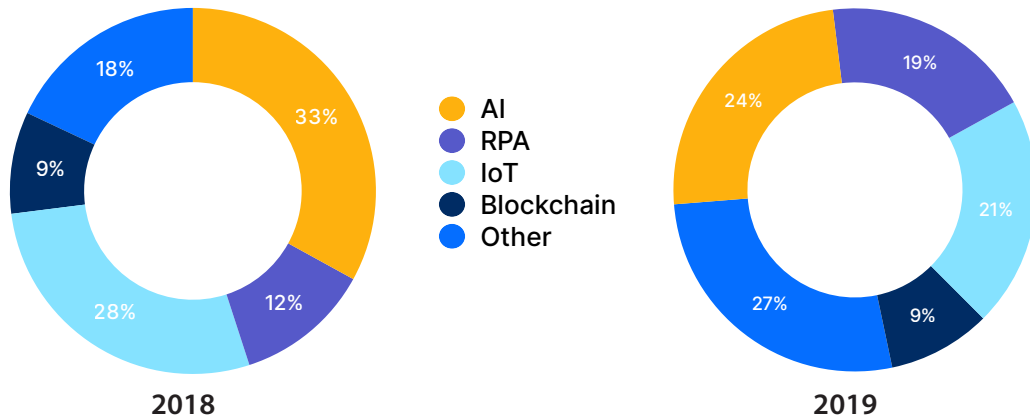
The majority of logistics service providers surveyed still only employed between 1-5 data scientists. Amongst service providers and shippers, larger players are investing more heavily but these are a small percentage of the industry overall, which is no surprise. Given the large capital outlay required, established players with larger budgets and existing talent pools will continue to break further away from the rest of the pack.

It's worth spotlighting this further as, despite the pressure to transform in-line with competitors (and especially with the drive to digitize), the lack of skilled data scientists available in the industry means that many firms either have no choice but to orient themselves away from this mode of working, or are seeking to outsource this function to technology solution providers, reinvigorating the age-old debate of 'build versus buy'.



Disruptive Technologies

Which of these technologies is currently yielding the best RoI for your organisation?



AI continues to provide the best return on investment for most businesses, whilst RPA has gained some ground since 2018, now accounting for the best RoI for 19% of respondents (compared to 12% in 2018), along with investment in the Internet of Things ecosystem. This is consistent across both shippers and technology service providers as IoT implementation opens up information across the supply chain, with internal and external stakeholders able to access an assemblage of important information, and the 'track-and-trace' sector helping to reduce costs and improve efficiency in asset tracking across warehousing and distribution networks.

Though investment in blockchain appears to be paying early dividends for at least 10% of firms, how much of this is speculative is still unknown. As replies to our proof-of-concept question demonstrate, even the possibility of integrating blockchain into production seems to be further off than excitement around it would suggest.

'Artificial Intelligence' (AI)

The broad range of automated, data driven systems being implemented across the logistics industry and beyond. Also referred to as 'cognitive technologies', AI mimics and expands conventional understandings of intelligent activity.

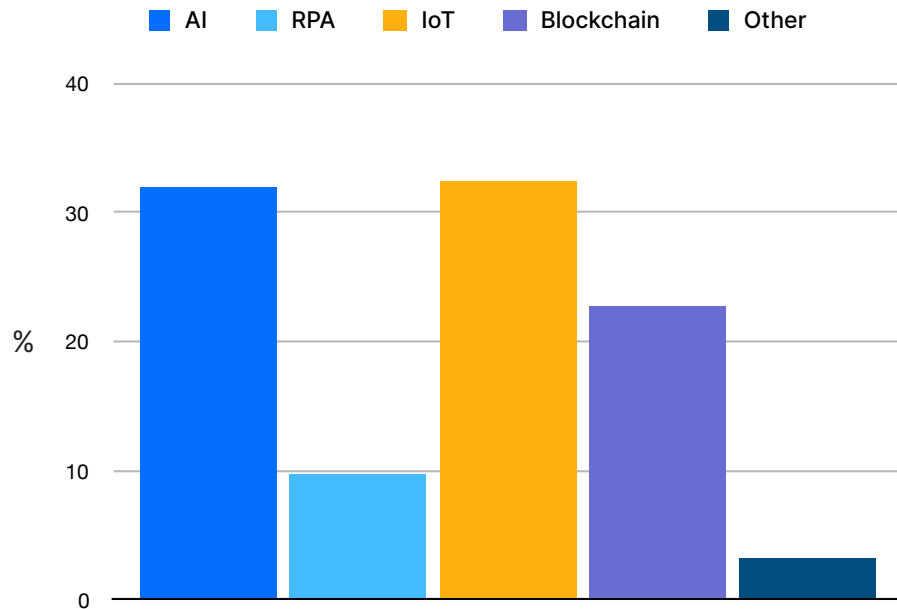
'Machine Learning'

The use of applied statistical techniques to create computational models that learn from large sets of data in order to autonomously carry out cognitive tasks (such as large-scale data analysis, product forecasting, pattern recognition for quality assurance and more).

'Robotic Process Automation' (RPA)

A set of automated software services that accelerates repetitive, rule-based interactions with I.T. applications, removing the need for employees to spend time carrying out predictable computer based tasks.

Which of these disruptive technologies will have the biggest impact on the industry in the next 12-18 months?



Despite currently delivering positive returns along with IoT systems, confidence in RPA for further gains is low; usurped in the short-run by blockchain - which over 20% of firms believe will see returns in the short and long-term - investment in RPA has not returned a sufficient gain to induce confidence amongst companies we surveyed. In contrast, short-term sentiments around IoT architectures are favorable, with companies telling us that they believe it is poised to have a big impact in the next 12-18 months.

IoT's potential to both improve visibility in everyday activities by providing time series data on variables in the production process opens up the possibility for dynamic route scheduling and demand synchronization. This means that IoT, in the short term at least, functions as the motor behind adaptation within the dynamic network of contemporary logistics.

Looking further ahead, there are a variety of other potentially disruptive technologies on the horizon, including blockchain and autonomous vehicles. However, we view the IoT (and relatedly, 5G) as having the most potential for disruption. Based on our work with major manufacturers, we have a front-row seat to just how transformative IoT will be.

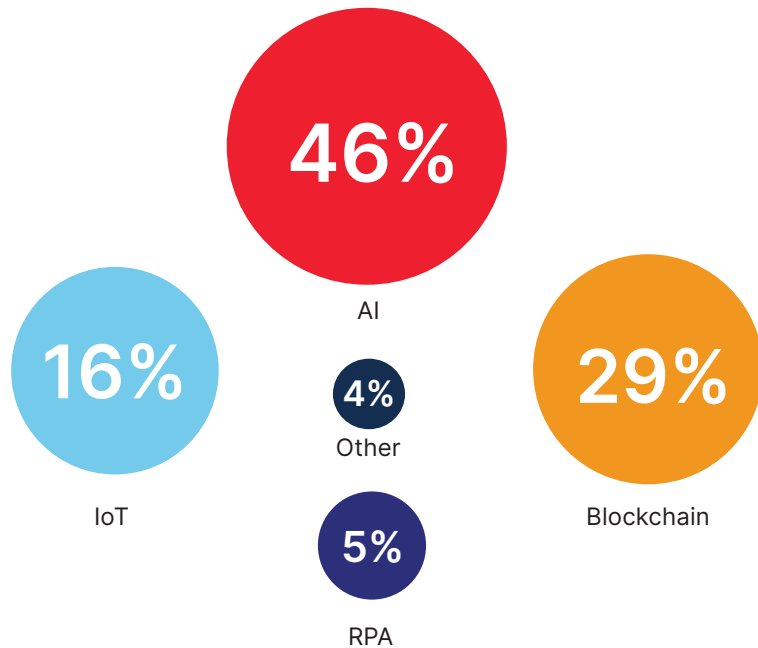
As more and more devices throughout the supply chain and manufacturing process become part of the IoT, they will produce an even richer data stream that will send signals in real-time that trigger a wide variety of events, including, for example, the need for a truck to transport a shipment of goods. The key to leveraging this wealth of data is implementing an extensive technology platform that can process it into insights that drive supply chain efficiency.

Greg Carter
CTO, GlobalTranz



Which of these technologies will have the biggest impact on the industry in the next 5 years?

Over the next 5 years AI and Blockchain technologies emerge as the primary forces determining the future of the industry. Stemming from large-scale transformation within the industry, the value of AI and blockchain will find itself propelled by machine learning systems being put into place across all facets of the supply chain. We will see digitised assets being used for process simulation: optimizing production decisions through demand-sensing, quality assurance, optimizing product mixes and organizing transport routing, all contributing to a self-organizing digital supply network at the heart of the industry.



Traditional systems like ERP and TMS systems are really limited in the way they calculate recommendations for supply chain operators. 5 years from now every transportation company will use artificial intelligence to power the way they make decisions.



Stephen Pratt
CEO, Noodle.AI

Coming out of the consumer world, I was really surprised how little linkage there was with key systems whether that's with EDI or APIs, I think the consumer world and the retail world and their supply chains are much more advanced in terms of being connected electronically, but I do see transportation and logistics now catching up.

We have a lot of complexity in our business which I think drives even more need to have the backbone of the technologies linked so that that's all getting communicated. But on top of that I still think we need people that are cooperating and communicating to make it work through the good times and the bad.



Curt Stoelting
CEO, Roadrunner Transportation Systems

Have you done a proof of concept for the use of blockchain in your organization?

Last year, our report outlined the potential for blockchain within the logistics industry, but we were careful to note the caution with which some firms were approaching the technology. Not much has changed in 2019.

The majority of firms surveyed have still not worked on a proof of concept for the use of blockchain, despite many noting their confidence in its short and long-term potential for the industry. Consistent with our findings in 2018, around 25% of respondents were still considering whether it would be worth pursuing a proof of concept at this stage, looking to industry leaders to give focus and clarity to a still obscure source of value.

The promise of blockchain within the logistics industry has perhaps been marred by the rate at which companies offering solutions come and go in the space, meaning that a tentative approach appears more optimal than tenacious with this technology.



70%

of all firms had yet to carry out a proof of concept in 2018

68%

of all firms had yet to carry out a proof of concept in 2019

25%

of all firms are still considering the possibility.

Cybersecurity

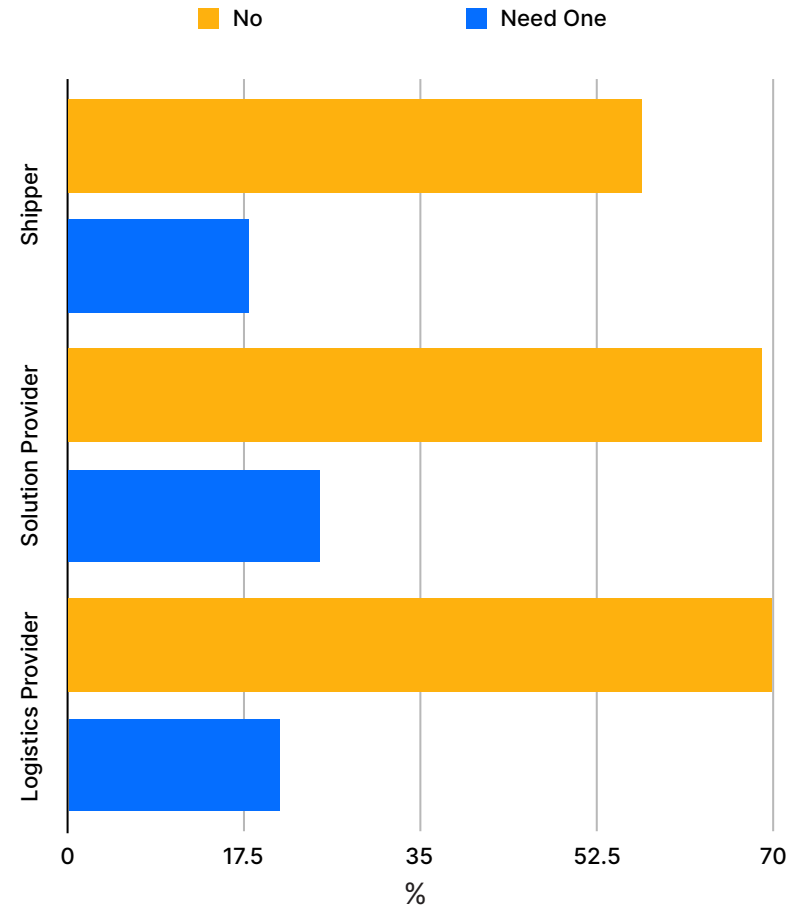
Disruption to the supply chain can come from anywhere; adverse weather conditions, technical malfunctions and human error are just some of the challenges posed to the traditional logistics model. Now, the scale of these disruptions can loom larger across companies, as the logistics space continues its move from a fragmented mode of operation towards a more interconnected, distributed and open system in which critical information is more accessible and actionable.

These dynamic data flows are prone to cyberattacks as information is increasingly targeted by third-parties. Interconnected systems are subject to butterfly effects across the digital supply network, and insecure systems coupled with lax security practices can have damaging knock-on effects.

Our report last year underlined the importance of maintaining up-to-date systems and instituting best practices amongst all employees to avoid these problems.



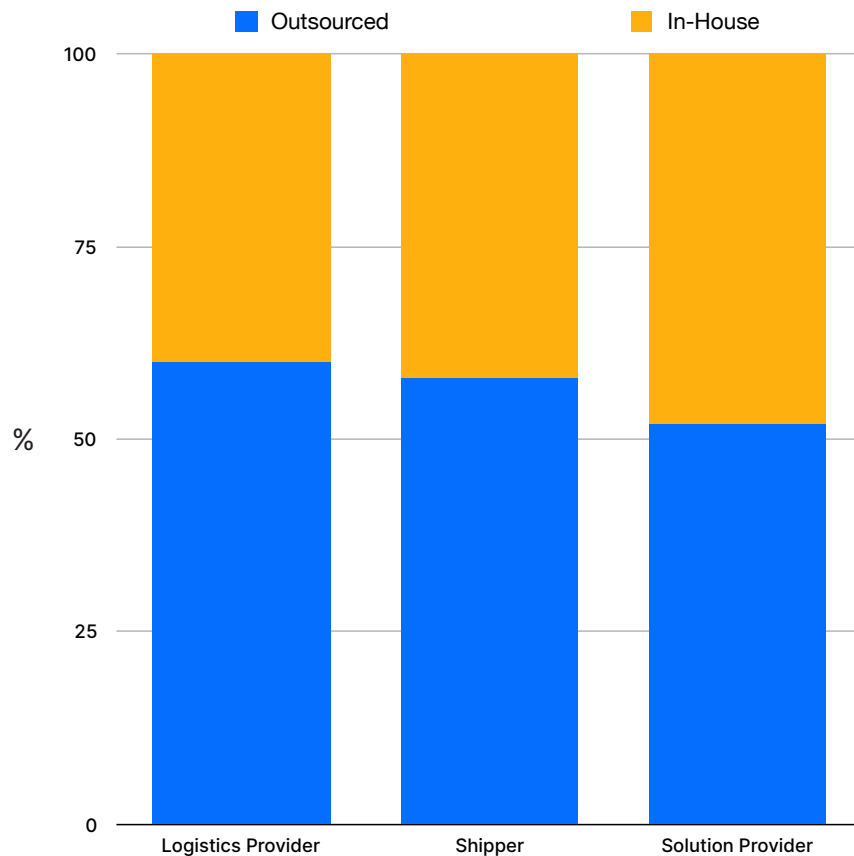
Does your company have a Chief Information Security Officer (CISO)?



Despite the concerns surrounding cybersecurity, the majority of logistics service providers still lack a Chief Information Security Officer, with only 21% of those surveyed believing that they needed one. Only 35% of both solutions and service providers had a CISO, lagging behind 43% of all shippers.

Is your cybersecurity threat management outsourced or formulated in-house?

The majority of solution providers (58%) still keep their threat management internal, mirrored by 60% of shippers that are seeking to keep all threat management in-house - a more feasible scenario for the larger players in the industry - whereas service providers have a fairly even split between outsourcing and internal management.



Does your organization provide enough training on cybersecurity threats for employees?

Following our report last year companies have made a positive change in cybersecurity training programmes for staff, with 50% now satisfied with the quality of training on offer. The severity of the threat posed by malicious actors in the logistics space has begun to sink in and employees are being educated on common phishing attacks, password security and proper authentication protocols. Of all respondents, solutions providers were the most satisfied with the quality of their training, but shippers and service providers were equally as pleased - an improvement upon 2018.



Conclusion

In sum, 2019 emerges as the year in which logistics companies double down on 2018's gambits into new technologies, taking steps to introduce more secure and sustainable practices as the industry continues to undergo its technological transformation. Cyberattacks have emerged as a novel threat, targeting vulnerabilities in a digitizing industry finding its feet. However, whilst the logistics industry has been swift to work on previous failings and more comprehensive training programs have been introduced, the dearth of CISOs in the industry, coupled with a negative sentiment around their necessity, signals that the logistics industry is still not seeing security as a primary part of business operations.

Training programs are ever more vital as warehouse and transportation operations become more digitized, augmenting the skillsets necessary for workers and owners in the logistics space. The introduction of drones as a category in this year's investment options illustrates how transportation and warehouse management are transforming in line with predictive and decision-making parts of the business and the move towards the 'smart factory' as the foundation for autonomous workflows. As warehouse space remains low the rise of more flexible warehousing solutions (and technologies to navigate these spaces) will continue to incentivize companies to adopt innovative solutions that can propel them towards their efficiency goals and improve performance throughout the supply network.

However, not all companies have the requisite talent or experience to be able to move as fast as industry leaders in this regard. Cultivating an accessible culture around technology and data is a necessary precursor to greater adoption of leading data-based practices. Creating accessible UX and UI experiences for interaction with data-centric processes will help increase adoption rates across the industry, and open the doors to collaboration and experimentation between more traditional businesses and more modern methods of working, without sacrificing focus on the goals guiding those businesses.

