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As this year’s report makes abundantly clear, a lot is changing in the modern logistics industry.

This change — and the increasing rate of change — presents both opportunity and risk. The challenge for IT executives, therefore, is how to make sense of all this change to make the right investments that will allow your organizations to win in this future.

The big message of this report is that the building blocks still count — there are just a lot more of them now. The key to making it all work, therefore, is to not focus on any one building block, but to instead keep your eye on one thing: putting the blocks together to create advantage.

It is easy to be swept up by new technologies. But this has never been about the technology.

Underlying the report’s data is a need to focus on the customer and meeting their ever-changing needs with creative and unique solutions. Doing so, however, will require that you do more than adopt new technologies.

Executing this transformation will require that you look upon every customer interaction and every business process with fresh eyes. It will demand that you close the talent gap — not only in your development teams, but across every facet of your organization as creating technology-driven advantage becomes a strategic imperative.

We are in the midst of one of the most tumultuous — and awe-inspiring — times in modern history. Technology is reshaping organizations, business models, and entire industries. Your organization is looking to you to lead them into this future.

Are you ready?

Charles Araujo, Founder, Institute for Digital Transformation & Principal Analyst, Intellyx
Introduction

The modern logistics industry is moving at a rapid rate, with organizational and technological innovations emerging in abundance alongside shrinking lead times and heightened customer demand, all of which is proving to be a key driver and strategy dictator in the contemporary logistics scene. 2018 sees companies continuing to shape the future of logistics hand-in-hand with their customers, matching their desire for new technology and increased efficiency with digital innovation and swift action.

One of the challenges of innovating in the accelerated space of contemporary logistics results from the proliferation and universalization of technology within the industry, which has left some companies vulnerable due to asymmetries in employee knowledge. Companies are continuing to work towards building sustainable and sound security practices in an era of continually evolving technology and legislation.

This report is made up of expert insights from over 230 industry professionals, from predominantly North American based individuals, with 42% of respondents working at logistics service providers (3PL, 4PL, trucking, ocean, freight), 39% at solution providers, and 19% at shippers (retailers/manufacturers). This year’s report includes in-depth remarks from:

- **Paul Richardson**, Chief Innovation Officer, DHL
- **Jeff Shorts**, Chief Information Officer, Neovia
- **Lori Homsher**, VP Engineering and Technology, J.B. Hunt
- **Kevin Glynn**, Chief Information Officer, DSC Logistics
- **Rob Cook**, VP Technology & Solutions, Sheer Logistics
- **Guillermo Pardon**, CTO, CaseStack
- **Shoaib Makani**, CEO, Keep Truckin
- **John Monarch**, CEO, ShipChain
- **Nick Chodorow**, CIO, Belt Railway of Chicago

Presented here is an overview of the trends and focuses they highlighted in response to our questions.
Another year goes by in the digital revolution and the logistics industry is striving to find a healthy balance between modern innovation and traditional ways of working. This year sees a deeper integration of Big Data and A.I. based solutions into the supply chain, along with the rise of Blockchain technology as a potentially revolutionary prospect for the future. Companies are looking to new technologies to help innovate and iterate upon their existing platforms and to develop secure, sustainable ways to migrate large-scale and complex environments to modern systems.

**What are you looking to invest in over the next 12 months?**
The logistics industry has already taken big steps to introduce digital technologies in recent years, from sensors that monitor and collect data on temperature or moisture-sensitive products in transit, to robots that increase warehouse productivity."

Paul Richardson, Chief Innovation Officer, DHL Supply Chain

The logistics industry continues to heavily invest in transportation management in 2018. 63% of all respondents cited this as their primary area of spending, which comes hand-in-hand with the uptick in spending on predictive analytics to help better organize newly digitized fleets. Companies are seeing the benefits of a stable supply chain and distribution system and so this spending is coupled with a rise in investment in warehouse management, up 10% from last year, and sustained expenditure focused upon improving business intelligence.

2018 has seen solution providers gain some ground as innovators within the logistics space. With a 10% increase upon last year, they have been driving innovation and closing the gap between them and service providers and shippers, who are seen to be sharing an equal role in driving the need for innovation.
What is driving increases in spending?

In a saturated marketplace, company differentiation is still the primary driver for spending. No doubt this is due to heightened awareness of customer demands, increasing from 9.6% in 2017 to 20.2% in 2018. Companies wishing to distinguish themselves from other providers would be wise to take notice of the old adage ‘the customer knows best’, as this is proving a productive strategy to follow.

As Paul Richardson notes, technological innovation often stems from customer desire, a point illustrated by the fact that 21% of respondents also cited taking advantage of emerging technologies this year, spurred on by customer demands.

What is primarily driving your increased spending? (2018)

Creating a differentiator for our business: 20.2%
Taking advantage of new technology: 9.6%
Customer demands: 12.5%
Updating legacy systems: 2.9%
Keeping pace with the competition: 33.7%
Other: 21.2%

What is primarily driving your increased spending? (2017)

Creating a differentiator for our business: 26.9%
Taking advantage of new technology: 15.4%
Customer demands: 36.5%
Updating legacy systems: 9.5%
Keeping pace with the competition: 9.6%
Other: 1.9%
Whichever category it fits under, being closer to customers and their industries is ever-more important as supply chains become more complex, requiring tailored solutions that are industry or even customer-specific. The automotive sector, for example, is being transformed by the shift towards electric mobility which could require new solutions for battery logistics.

In life sciences, increasing temperature-controlled shipments will require higher levels of security and integrity in transportation. And in the technology sector, changing consumer buyer behavior and sales channels combined with increasingly shorter product lifecycles will require flexible solutions to address peaks in transportation and goods storage.

The availability of information to consumers is unprecedented, and their power to compare prices worldwide has made markets much more price-sensitive and has also been a driver of the commoditization of logistics itself. The demand for e-commerce delivery is significantly shaking up basic goods and general household goods already, reducing the amount going to retail to instead focus on fulfilment and distribution.

Paul Richardson, Chief Innovation Officer, DHL Supply Chain

John Monarch, CEO, ShipChain
In addition, new legislation on digital practices has opened up new opportunities for innovation. One example of this is the Electronic Logging Device Mandate (ELD). The ELD was enacted in 2012 by Congress to ensure the use of electronic logging devices by all drivers, in order to digitize and replace the paper logbooks used to record their hours of service. Fleets were given until December 2017 to do this, and those who had already implemented forms of automated on-board recording devices were given until December 2019 to comply with any additional specifications. Both the automated on-board devices and ELD’s offer deep and actionable insights into driver and truck data, opening the doorway to new infrastructures being built on the back of this legislation.

"Technology presents big opportunities to both enhance existing operations and open up entirely new ways of working. Our customers demand technological innovation as part of the service we provide, keeping us focused on the future, but it can often also be the product that drives business growth. We believe that open innovation is pivotal to providing the best service. This means working closely with customers to develop solutions, incorporating early feedback, understanding their challenges, and ultimately developing the solutions they need for the future.”

Paul Richardson, Chief Innovation Officer, DHL Supply Chain

“The ELD mandate is relatively new, but it does have the capability of providing data that we have never had access to before. Driver hours, predictive analytics on accidents, vehicle repair, etc.”

Rob Cook, Vice President, Technology & Solutions, Sheer Logistics
IT departments continue to thrive in the contemporary logistics scene, with a year-on-year increase in spending for shippers, logistics service providers and solutions providers. Furthermore, the number of firms decreasing spending has dropped to only 2% this year, acknowledging the value of previous investment in IT and, more importantly in sustaining this expenditure. The increased use of outsourced technology solutions still requires in-house teams to maintain and patch potential issues, especially as legacy systems are yet to be entirely phased out.

**Does your IT department engage directly with customers?**

As technics takes center stage in the logistics sphere, IT has seen its operations increase exponentially: liaising more and more frequently with customers to ensure that their interests are properly handled. Companies with a more hands-off approach are dwindling in number; the necessity of anticipating and responding quickly to customer issues in an increasingly digitized industry means that IT is more involved than ever. New technology brings new challenges to the industry, heightening the importance of well-funded and well-connected IT departments to mitigate any potential problems.

**How involved are IT executives involved in your company’s sales process (2017)**

- **Never involved in the business development process**: 20%
- **Increasingly involved in the business development process**: 80%
- **Decreasingly involved in the business development process**: 0%
IT’s importance is also evinced by their role in the sales process, taking on more of a prominent role in sales as they have the technical expertise necessary to convince clients of both the benefit and ease of implementing new technologies. As the above charts illustrate, IT executives are becoming heavily involved across all three verticals, as they are well equipped to navigate the potential pitfalls of hasty adoption; now that technology has taken centre-stage across the industry IT executives are liaising across verticals to help firms make informed decisions on sales.

Furthermore, with so many start-ups and digital logistics solutions emerging, IT departments are being turned to in order to help sort through the herd and find the ones with promise.
How many developers (computer engineers, programmers etc.) does your company employ?

Compared to last year’s study, there has been a noticeable upturn in the number of logistics companies employing developers in their organizations. 63.7% of companies employ more than 5 developers, while only 6.3% employ none. Across the three verticals, all firms tended towards the lower end of the spectrum, but especially shippers, with 50% of firms employing between 1 and 5 developers. Although logistics service providers were more varied, with some organisations currently employing in excess of 200 developers, the majority of firms stated that they also employed only between 1-5 developers. The fact of the matter is that logistics is an increasingly digital industry. The most important decision therefore is “insource or outsource?” The transcendence of digital across the industry though has meant that logistics companies choosing to outsource still require some developer presence in their workforce - whether to maintain systems, respond to emergencies or even to tailor solutions to their organization’s needs.

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

The last 5 years have seen an explosion in the number of startups looking to find a home in the logistics industry, no doubt helped by the global boom in new technologies (AI, blockchain, etc). Customer demands have meant that the logistics industry has been pushed to find innovative solutions and new modes of working; from blockchain technology and smart brokerage platforms, to robotics and machine vision technology in the warehouse, the industry has quickly been opened up to the advantages of technological innovation, and companies are beginning to truly embrace and understand the connectivity and integration the new digital world offers.
The industry is still doing its due diligence when it comes to acquiring start-ups. In this milieu of innovation, the influx of tech start-ups in the logistics space reflects a promising outlook on the industry’s digital future. This being said, logistics service providers made it clear to us that their industry is making more headway on this, with 67% actively assessing start-ups in the field. Solution providers were split, with half of providers stating that they were judging potential partnerships or acquisitions, and the other half telling us that they were not actively looking at this time. Shippers overwhelmingly stated that no assessment was being undertaken, with 60% of firms responding no. This might be due, in part, to the surge in digital freight matching platforms, connecting shippers to carriers more readily. Whether there is any utility in acquiring a start-up remains a question, as regulatory changes (such as the aforementioned ELD mandate), are still in flux and raise new issues and avenues for tech start-ups to navigate, with new problems and solutions emerging constantly, making it difficult to plan acquisitions effectively.

“The rise of logistics tech start-ups will have an enormous impact on the logistics and transportation industries at a scale that has not been seen before. Encouraged by the December 2017 ELD mandate, we’ve only begun to scratch the service of how bringing carriers online can rapidly evolve the way that fleets operate.”

Shoaib Makani, CEO, Keep Truckin
Talent

Although we have seen a flood of technology, firms are still finding it difficult to first obtain and then retain the top-level talent needed to develop and iterate upon in-house solutions. Building effective platforms for global distribution networks or quite specific area requires top engineers, who can be difficult to come by in a climate of low unemployment and attractive propositions from emerging technology sectors.

"Being that our organization provides customized software solutions that support our Neovia Operating System for warehouses, our biggest challenge is finding key technology talent in a low global unemployment environment."

Jeff Shorts, CIO, Neovia

Tech giants such as Facebook, Google and Amazon have long been investing in new technology, and the talent to build it, from a much earlier stage than many in the logistics industry, meaning that companies are having to play catch-up to outside investors.
Innovation is no longer being fueled by large-scale investment in technologic capital. Instead, human capital; the fostering of a general intellect as an organizational principle is one of the most promising investments to be made. However, this can only be done through retaining talented employees, something the logistics industry has struggled with, given the allure of creative teams in other industries. This continues to be an enduring problem. However, firms are now looking at new methods to attract high calibre talent. “Collaborative work” and “encouraging entrepreneurial spirit” are popular methods being used at the moment.

The primary differentiator is talented individuals who are capable of thinking outside of the box. Companies that are willing to foster great ideas and creativity are the reason why technology is now accessible to even the smallest carriers.”

Shoaib Makani, CEO, Keep Truckin
Disruptive Technologies

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

Which of these disruptive technologies will have the biggest impact on the industry in both the short (the next 12-18 months) and long-run (the next 5 years)?
No question for me the next 12-18 months are all about AI development, or more precisely predictive algorithms.”

Kevin Glynn, CIO, DSC Logistics

As we get more familiar with Machine Learning and continue to remove the science-fiction cloud that surrounds it, we will see more and more effective uses of it that can have a great impact on day-to-day activities that we felt were too trivial for its use. Keep an eye on Augmented Reality.”

Guillermo Pardon, CTO, CaseStack

The results for both short and long-term speculation outlines two distinct drivers for the future of the industry: Artificial Intelligence and Blockchain technologies. In all verticals these two technologies are are viewed to be tied in their potential for the short term, with 32% of firms highlighting them as their primary drivers for the immediate future. Furthermore, there is a clear synergy between AI and blockchain as integrated processes that aid in brokering and managing exchange, executing contracts and improving shipping efficiency. The ability to quickly and securely parse and compute over immense sets of distributed data, resulting in actionable and profitable insights, will be of great value going forward. It is also worth noting that logistics service providers cited Internet of Things devices as currently providing the greatest RoI for them and, as such, view IoT to be harbouring just as much potential as AI and Blockchain technologies in the short-term.

In the long-run however, AI pulls far ahead of blockchain technologies. Over the next 5 years 49% of firms believe AI will have the greatest impact, compared to 27% citing blockchain as having the most potential. This is understandable, as 66% of all firms we surveyed have yet to do a proof of concept for the use of blockchain technologies in their organizations. AI is already in use around the industry; from machine vision in unmanned systems to object identification and classification in the warehouse, the use of AI fits more readily into current practices... and is already seeing a return, with 33% of firms stating that AI yields the best ROI for them. In contrast, implementing any blockchain-based technology requires a more extensive and costly change in company procedure and, as such, only 10% of firms are currently seeing any return on their investment in the technology.
The latest DHL Logistics Trend Radar highlights four key technology trends which are either emerging or evolving in an exciting new direction.

**Bionic enhancement:** Wearable technology has been on the industry’s radar for some time now. Bionic enhancement builds on this trend, but incorporates the opportunities that exoskeletons could offer. In logistics, expanding the boundaries of our physical limitations enables new ways to increase process efficiency and improve health and safety.

**Digital identifiers:** Smart sensors, tags and biometrics are pushing logistics processing towards a new level of granularity. This evolution means that single units, components and even individuals can be securely identified through unique, digital codes.

**Self-learning systems:** Advances in algorithms, computational power and hardware are enabling new forms of machine learning applications in logistics. These offer immense potential for autonomous data-driven decision making and process optimization.

**Unmanned aerial and self-driving vehicles:** The relevance and maturity of autonomous logistics has advanced over the past few years, making widespread adoption a not-too-distant prospect. This development could open a host of new opportunities when it comes to time slots and new delivery routes.“
Blockchain in Logistics

Blockchain; a distributed digital ledger upon which data can be recorded, secured and verified, has been one of the most talked about topics in the industry this year. Heralded as a revolutionary technology with far-reaching implications for the future of finance, data security and digital identity, and governance (to name a few) - this logistics industry is seen as ripe for the use of the technology.

The use of smart contracts in a blockchain based system could present a new horizon of efficiency gains and customer retention via total transparency and traceability through the supply chain. Fewer missed sign-offs, and deeper integration with tracking software means that shipments can arrive on time and complete, with everything accounted for and verified along the way.

“One year ago, I would have said blockchain was a game changer. Six months ago, it was Hype. Now, I’m on the fence. Having said that we have derived a few business use cases that fit well into the Blockchain universe.”

Rob Cook, Vice President, Technology & Solutions, Sheer Logistics
However, as the below graph shows, not all companies in the industry are convinced. Almost **70%** have not even undertaken a proof of concept yet, while not even **10%** have completed one. There is still much skepticism about the ability for the technology to fundamentally disrupt the industry. Moving beyond simple proof of concepts towards a situation where the technology is being deployed at a scale where the true benefits are realized requires a cross-industry collaboration that is far easier said than done. The logistics industry is highly fragment and the space needs leaders and consortia to facilitate the collaboration that is much needed. The technology promises a lot, we wait to see what the future brings.

We have a number of blockchain initiatives in the works, including one that has already demonstrated value in the supply chain among several trading partners. We see a lot of future value in blockchain, especially where multiple parties are dealing with the same information across disparate systems.”

**Lori Homsher, VP Engineering & Technology, J.B. Hunt**

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

- **Yes**
- **Not yet**
- **Thinking about**
Solutions providers told us that their customers are implementing a mix of descriptive and predictive analytics, with the majority of firms (57%) focusing on descriptive analytics, compared to 45% using predictive analytics. Interestingly, a growing subset of whilst respondents noted the use of prescriptive analytics, with 26% of solution customers implementing these in addition to descriptive and predictive models of analysis.

Lori Homsher is a vocal proponent of the value of AI when combined with predictive analytics. The application of machine knowledge to “predict and provide recommendations to achieve a specific outcome” is invaluable for a business that wants to adapt to the pace of the market.
Cybersecurity

Access to technology has become more ubiquitous around the world, and is steadily seeing greater adoption in emerging economies. However, whilst access to technology has aided in the development of innovative security solutions (through white-hat hacking communities and other sanctioned testers), it has also increased the necessity of implementing strong security protocols. The logistics industry is a key target for would-be hackers and over the past year there have been a great deal of successful attempts to gain access to confidential data.

Non-technical employees in the industry are both the first line of defense for the industry and the primary targets for malicious actors. Developing strong security practices happens at both the technical and the social level – a good education on the ways in which they might be targeted will aid employees in defending their data and help prevent prying eyes from gaining access to the body of newly digitized data and information companies have been using to improve their services.

Different types of cyber attacks

Cyber crime worldwide cost $400 billion in 2015 and is forecast to reach $2 trillion in 2019*

- Malware
- Man-in-the-Middle Attacks
- Phishing
- DDoS
- SQL Injection Attack

Source: Techterms.com, Lloyds of London, Forbes*
Does your organization provide enough training on cybersecurity threats for employees?

Overall, most respondents felt that training on cybersecurity was adequate. However, shippers (retailers, manufacturers) stood out with 55% wanting more information and preparation from their companies on how to identify and address potential threats. Data is the most valuable commodity of our age, but employees are lacking guidance on how to spot malicious attempts at accessing it, and companies would be mindful to implement basic training strategies to protect themselves.

The ability to identify phishing scams or other simple social hacking methods, along with an understanding of the utility of password managers and two-factor authentication should form part of a basic education and understanding that all employees share.

Shippers:

| 55% - Need more training | 45% - Have adequate training |

I’m an advocate of a two-prong approach. The first prong is a strong Employee Awareness Program and the second is solid technology built and architected with cybersecurity in mind. Employees should have no issues with being a part of the Employee Awareness Program as it not only benefits them at work but also in their personal lives. We’ve gotten some positive feedback from our employees when it comes to this.”

Lori Homsher, VP Engineering & Technology, J.B. Hunt

Nick Chodorow, CIO, Belt Railway of Chicago
Conclusion

In summary, 2018 indicates that companies are increasingly seeing the power of bringing IT front of house and putting forward a tech-centric plan for the future. Some steps have been tentative, but others, such as the implementation of AI based solutions in supply chain and warehouse management have already seen a considerable ROI and are being readily utilized as integral parts of a more streamlined process.

This, coupled with a greater adoption of emerging data-science talent and provisional steps within the industry towards engaging with less tried and tested technologies, like Blockchain, sees all verticals in the logistics space continue to push forward into its digital future. This concerted effort to update working practices and start embracing contemporary technical innovation promises to make the logistics industry a more exciting industry to be a part of.

However, there is still a lot of work to done, especially when it comes to cybersecurity. This report has highlighted the inadequacy of security training for employees, which still represents a divide between traditional ways of working (and domains of knowledge), and new digital ones. As IT embraces a front-office role, other departments need to become more familiar with the back-office practices and techniques that are driving the industry forward.
Logistics CIO Forum
6-7 NOVEMBER, AUSTIN

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Key discussion topics:

- **Network Security:**
  Discuss the ever-increasing issue of supply chain cyber risk and how best to protect your organization and data.

- **Disruptive Technology:**
  Explore the most innovative and relevant technologies (such as IoT, Blockchain and AI) that will have a transformative effect on the logistics industry and generate sizeable ROI.

- **Technology Adoption:**
  Learn how LSPs are creating an environment that is ripe for long term innovation whilst still balancing the needs of the present.

- **Customer Focused Growth:**
  Find out how to create a dynamic and agile platform that is responsive and able to meet customer’s expectation of immediate and secure deliveries.

- **Digital Collaboration:**
  Understand the long term advantages that can be created by effective, mutually beneficial collaboration across the supply chain.

Speakers Include:

- **Lutz Beck** – CIO at Daimler Trucks North America
- **Steve Martino** – SVP and CISO at CISCO
- **Nick Costides** - Global VP of Information Technology at UPS
- **Sally Miller** - CIO at DHL
- **Chris McClincy** – SVP and CIO at Expeditors
- **Jason DeLoach** - VP Supply Chain Engineering Solutions at Americold
- **Jeff Shorts** - CIO at Neovia
- **Lori Hornsmer** - VP Engineering and Technology at J.B Hunt
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