



# **FREIGHT REVOLUTION**

**THE SUPPLY CHAIN WILL  
NEVER BE THE SAME**

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Freight Revolution: The Supply Chain Will Never Be the Same

FreightWaves Publishing

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# **FREIGHT REVOLUTION**

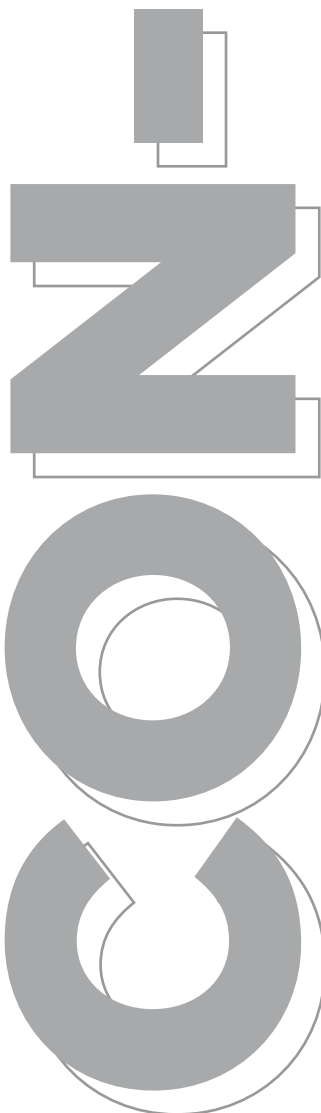
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**07 | WORD FROM  
THE EDITOR**

---

**08 | INTRODUCTION  
BY CRAIG FULLER**



# 01 TECH REVOLUTION

---

**12 |** Connecting the Data Dots: Integration's Important Role in the Freight Technology Revolution

**PHIL JOHNSON**

**16 |** Transportation and Logistics 2.0: Reawakening to Technological Disruptions

**MIKE VALNEV**

**20 |** Alternative Data In Transportation

**DANIEL PICKETT**

**24 |** Up Close with the Future of Transportation: The Age of Hyperloop, Air Taxis, and Autonomous Cars

**VISHNU RAJAMANICKAN**

**30 |** The Social Impact of Coordinating Cloud Computing

**MICHAEL CARMODY**

**34 |** Sea Change in Shipping

**MIKE ANGELL**

**38 |** Lessons from Underdogs: How to Level the Playing Field and Win the Logistics Game

**CHRIS RICCIARDI**

# 02 BLOCKCHAIN IN APPLICATION

---

**44 |** The Hard Part: Moving Past Buzzwords


**BRIAN GLICK**

**50 |** Eliminating Fraud through Blockchain Records Based on Open Standards

**JAMIL DEWJI**

**54 |** Security in a Data-Centric World

**BRIAN STRAIGHT**



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**FreightWaves is a data and content forum that provides market participants with near-time analytics on the state of the freight market and tools that provide actionable outcomes.**  
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## 03 AUTOMATION AND THE SUPPLY CHAIN

---

**60 |** Lights-Off Logistics: Using AI and Advanced Analytics to Automate Supply Chain Decisions

**GREG PRICE**

**64 |** An Industry Analysis: How Clearly Are We Seeing Toward the Future Right in Front of Us?

**SAHEJ SINGH**

**70 |** The Cost of Convenience

**MARIA BAKER**

**74 |** Are You Ready for a \$5 Head of Lettuce?

**SUSAN FALL**

**78 |** Technology and the Future of Freight Brokerage

**FELIPE CAPELLA**

**84 |** Digital 3PLs Paving The Way

**ALEX RYU**

**88 |** Data-Driven Control of Distributed Reconfigurable Supply Chains

**CHIP WHITE**

**90 |** Technology Alone Will Not Save the Independent Broker

**BRUCE MCGONIGAL**

## 04 CAPACITY ECONOMICS

---

**98 |** How Does it All End? Resolving the Capacity Crunch

**IBRAHIIM BAYAAN**

**104 |** Hours of Service: What's Next?

**DEAN CROKE**

**110 |** Time, Money, and the Human Approach: How to Attract and Keep Qualified Drivers

**ASHLEY COKER**

**114 |** Upgrading Driver Recruiting

**LAURA ZIELINSKI**

**118 |** Is the Logistics Market Efficient?

**GREG CALLEGARI**

**122 |** A Look at What Trucking CEOs Said to Guess What's Coming in the Future

**JOHN KINGSTON**

# WORD FROM THE EDITOR

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WE ASKED INDUSTRY EXPERTS AND INSIDERS IN THE LOGISTICS INDUSTRY TO SHARE THEIR VISIONS AND ARTICULATE THEIR HOPES AND FEARS. WE SOUGHT DECISION MAKERS BEHIND THE BIGGEST BRANDS AND STARTUPS WHO CREATE BUZZ AROUND HIGH-IMPACT TECHNOLOGY ACROSS ALL INDUSTRY SEGMENTS: SHIPPERS, CARRIERS, 3PLS, SUPPLY CHAIN MANAGEMENT, MANUFACTURING, AND MEDIA.

WE SOUGHT TO CODIFY, CELEBRATE, DISSEMINATE AND DISCUSS INTERESTING AND PROVOCATIVE IDEAS ABOUT THE FASCINATING TIMES WE'RE LIVING IN AS IT RELATES TO FREIGHT AND INNOVATION MOVING INTO THE SHORT-TERM FUTURE. LIKE FREIGHTWAVES CONTENT, THE BOOK WILL BE FREE AND AVAILABLE TO EVERYONE. WE WANTED SOMETHING PROVOCATIVE, READABLE AND DATA-DRIVEN, AND THAT'S JUST WHAT WE GOT.

THE SECTIONS AREN'T HARD BOUNDARIES—IN FACT, ANY GIVEN ESSAY MIGHT TOUCH ON A LITTLE BIT OF EVERYTHING. WE ARRANGED THEM ACCORDING TO THE GENERAL AUDIENCE APPROACH. THEY ALL TOUCH ON LOGISTICS, THE SUPPLY CHAIN, AND THE CHALLENGES AND PERILS OF INNOVATION IN THE LOGISTICS MARKETPLACE.

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## INTRODUCTION

It wasn't even 20 months ago that FreightWaves began. Once we found our footing the results have been spectacular, more than I could have imagined. Every day I remain amazed at the people and places that mention us, link back, and recirculate our news.

As we anticipate our second major conference, with the MarketWaves18 event in Grapevine, Texas, I wanted to hear from industry visionaries and market leaders expressing their visions and articulating their hopes and fears. We also wanted to contrast this with our previous book, which was a long-term outlook. How clearly are we seeing toward the future right in front of us? The challenge is to fit it all into a concise and incisive essay.

In covering the daily news on FreightWaves we don't always get a chance to look ahead. This collection of contributors from a wide array of leaders in our industry does just that.

From my perspective, 2018 and beyond will see an accelerated convergence of automated and autonomous technologies in the trucking and freight industries. Blockchain proliferation in the industry will spread like wildfire. A group of hundreds of logistics top players have come together to form a blockchain consortium known as the Blockchain in Transport Alliance (BiTA). The organization is developing industry-wide standards for blockchain-enabled smart contracts that create trust between



unknown actors, increase visibility into the movement of trucks and goods, eliminate fraud, and streamline payments.

Today, asset-based trucking carriers devote enormous resources to the management of drivers: large fleets often contend with 100% annual turnover in their driver pool and have to offer generous signing bonuses and reimbursements for training programs to attract new drivers. Trucking is a \$700B industry, and a third of the costs go to compensating drivers.

As trucking becomes more automated, these carriers will shift toward data-intensive analytics to add value to the supply chain. Not only will wayfinding to avoid congestion and find cheap fuel prices be automatically optimized, but even trucking contracts themselves will be sorted, negotiated, and closed with the assistance of algorithms manipulating data sets that are only now being assembled and collated for the first time. Voice brokers, freight forwarders, and 3PLs with weak IT infrastructure that lack transparency will see themselves disintermediated and replaced by automated digital solutions.

Also, a new futures market is being created for trucking spot-rates. These cash-settled futures contracts will enable trucking market participants to hedge their shipping rates. This will, in turn, help to create index-linked contracts and markets, further enabling pricing and capacity transparency. It's already all happening with SONAR. The future is here.

— *Craig Fuller, CEO at FreightWaves*

**DATA IS  
EVERYWHERE,  
AND HAS  
ALWAYS BEEN  
EVERYWHERE.**

**PHIL JOHNSON**

SECTION ONE

# TECH REVOLUTION

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# 01



**CONNECTING THE DATA DOTS:  
INTEGRATION'S IMPORTANT ROLE  
IN THE FREIGHT TECHNOLOGY  
REVOLUTION**

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**PHIL JOHNSON**

**LET'S TAKE A TRIP BACK IN TIME.** As we travel a century or two into the past, consider for a moment some of the natural resources and rare earth elements that form the basis of modern technology: Lithium. Beryllium. Cobalt. Titanium. All unarguably integral to semiconductors, smartphones, aircraft and alternative energy. And all nearly inaccessible (and unprocessable) until now. They've always been there, of course, but these raw materials laid in wait until the technology was available to act upon and transform them into finished products.

The freight transportation industry is on the precipice of broaching this same frontier with data. Data is everywhere, and data has always been everywhere. Freight data is ubiquitous, it is useful, and acting upon this data has the potential to streamline operations, increase efficiency and spark new growth within freight transportation like nothing else before it—save for the internal combustion engine.

The industry's ability to access, interpret and effectively utilize all of this data, however, is still in its infancy. The problem with data being everywhere is that it's, well—everywhere, and it exists in all shapes, sizes and schemas. In a perfect world, the freight industry would confer to collaborate and construct a single unified schema to unite the disparate data streams generated from classic EDI, ELDs, modern APIs, the IoT and the imminent transition of data integrity to the blockchain-based ledger.

It's estimated that the move to a universal data standard and communication methodology will occur right around when pigs begin to take flight. In the meantime, the expanding role of middleware and integration technology providers will become the key to connecting the disparate streams of freight data being unleashed upon the industry and exchanged 24/7/365 between shippers, carriers and their trading partners.

Why will middleware providers still be needed? Isn't it the goal in and of itself to eliminate as many potential layers as possible between partners?

Data integration and translation between various applications, partners, protocols and formats requires a specific domain expertise, and devoting in-house technology resources to tackle project-specific tasks can be a risky venture during a transitional period such as the data and technology revolution the freight transportation industry is currently undergoing. Standards may shift (or fade), various partners can present a wide variety of technological requirements or mandates, and an ever-tightening market for the human resources required for implementing data integration technology can result in a less-than-fruitful hiring endeavor. The ability to implement and the agility to switch providers, applications

or approaches to technology to accommodate partners will be crucial to navigating this transitional phase of the data revolution.

We can explore two potential use cases in the freight transportation industry that exemplify the benefits of working alongside a middleware or integration provider in order to leap the technology gap in a more agile manner, while also minimizing the exposure of investing in new technology while standards and best practices are in flux.

The first use case details a freight transportation brokerage fully invested in the EDI (Electronic Data Interchange) ecosystem in order to integrate data with carriers, shippers and freight applications around the globe. They explore moving to a fully API-based system to exploit the real-time capabilities inherent in application-to-application communication but quickly learn that while the technology exists, only a select few partners are capable or willing to utilize it, there is a learning curve to implementation, and they are lacking the internal knowledge necessary to build out the project. In this scenario, a middleware or integration provider bridges both the knowledge and technology gaps for the brokerage and empowers them not to replace, but to extend their existing capabilities by providing a flexible solution that can integrate all flavors of data formats, document types, and communication protocols while scaling with their needs in an agile manner.

The second use case entails the imminent rise of blockchain technology and the competing interests certain to be at play during the frontier days of the distributed ledger.

In a perfect world, freight shipment data, documents and transactions would feed into and reside on THE immutable, centralized public blockchain. In reality, private blockchains have gained a foothold as individual shippers, corporations and partnerships prototype similar yet separate solutions to maintaining supply chain data integrity. While the current use of blockchain-based ledgers to record transactions is far from mandatory, the diverging development presents the interesting scenario in that customers and trading partners of these firms may not only be required to have the ability to place data onto a private blockchain, they may have to allow for the capability to integrate with multiple ledgers mandated by their various partners.

Once again, the willingness and ability to engage a middleware or integration provider capable of bridging this technology or skills gap will enable the hypothetical firm to take the leap head-on into the fascinating new world of freight data and application integration without the potential

risk of placing their eggs entirely into one basket. An extensible third party will not only be able to manage the various relationships, the integration provider's breadth of knowledge, experience and technology lends a degree of agility simply not found within the in-house implementation process.

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Regardless of whether you decide to partner with a third party or blaze your own trail in order to take advantage of new tools, this is an extremely exciting time to be on the front lines of the freight transportation data and technology revolution. The readiness to finally take advantage of millions of miles of data is palpable, and the ability (and willingness) to finally shake off the

industry's stodgy, technology-resistant reputation in favor of cutting edge methodologies and protocols like the blockchain and APIs is clearly within reach.

*Phil Johnson is director of marketing at Kleinschmidt, Inc.*



# **TRANSPORTATION AND LOGISTICS 2.0: REAWAKENING TO TECHNOLOGICAL DISRUPTIONS**

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**MIKE VALNEY**



**NEW YORK CITY IN THE YEAR 1900** held the same charm and bustle that it has right now, but out on the streets, the picture was quite different. In the place of swanky cars that whizz past on cemented asphalt roads today, it held horse-drawn carriages on dusty streets with no visible signs of a motor-powered vehicle in the vicinity.

What is fascinating is the metamorphosis of New York City—from being a city driven around by horses to being a metropolitan that embraced automobiles, the transition was by no means gradual. Pictures taken just thirteen years after 1900 speak a thousand words—in the streets where horse-drawn carriages were the norm they were now the exception, being replaced almost entirely by cars.

Technology has the inherent ability to transform societies in a relatively minuscule time frame. With technology makeovers happening nearly every other week, the freight industry is certainly in a transformational phase right now. To be fair, the revamping is not just freight-centric but is ubiquitous across different verticals in transportation, with Uber being an example. Technological disruption is key—businesses are now looking at a market that is easier to navigate and more importantly, thrive.

Part of the technological evolution has to do with how data analysis has helped redefine efficiency parameters in the industry. To an extent, the ELD mandate—although vehemently challenged—paved the way for fleet companies to collect copious amounts of data that could be used to understand not just the truckers’ habits, but also the inner workings of the truck itself. The data collected can be fed to machine-learning models, which can determine the health of the truck engine and help understanding when the said truck needs a maintenance stop.

Another technology that is redefining transportation is the prospects of autonomous driving and the impact it could have on the freight industry. Though this has long been a fascination in the field, the technology behind fully-autonomous vehicles did not exist until recently. Automation comes at different levels ranging from 1 to 5, with Level 5 marking a machine that could effectively run across all possible terrains in differing environments sans a human observer.

Right now, Level 3 automation vehicles are being perfected, with vehicles having the ability to understand traffic and obstacles around it intuitively and navigate tougher situations with the help of a remote human controller. Scaling up levels would require not just technological precision, but also a lot of data points from manual driving which would serve as the backbone of automation.

Concerning the freight industry, automation should be welcomed with open arms. The robust growth of the U.S. economy over the last year has lacerated an already worse driver numbers situation, with ATA projecting that the industry would have to contend with a shortage of 176,000 drivers by 2026 if the situation remains the same. Truck driving has always remained a physically and mentally taxing job, which millennials might

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not have the inclination to take up in the future. Autonomous or semi-autonomous trucks could help solve the issue.

While observing the growth curve of automation, the relevancy of government regulations should also be a subject of discussion. If regulations are not on point, the whole idea of autonomous vehicles on the roads might be moot. The situation requires governments to educate the masses on the advantages of autonomous vehicles, with test results and statistics to back up claims.

Also, with autonomous vehicles in the picture, data collection and analytics become key—leading us to a future where artificial intelligence and automation would go hand-in-hand in defining

transportation. Data points from the vehicle and also the environment in which it navigates would help optimize routes and planning schedules. The growth in e-commerce exerts a tremendous impact on the last-mile delivery patterns, which could extend to the first-mile as well, with maritime shipping and drayage optimization coming under the scanner.

As logistics processes become bigger and sophisticated with the influx of multitude stakeholders across the supply chain, it is critical for the industry to look at solutions that could streamline data sharing and data management across its breadth. Blockchain is one of the frontrunners, considered as a technology that could solve data sharing issues as it decentralizes the ledger that holds data, giving joint control to all the stakeholders in the chain.

Many logistics companies and 3PLs across different verticals are working on blockchain pilot projects, which is heartening. However, it also is essential to understand that blockchain would be a technology best served when it is clubbed with open standards, and not when it is developed behind closed doors as a proprietary solution. Companies need to evolve from being closeted businesses that are scared to share data, to

freely exchanging data through an immutable ledger like blockchain and gain collectively across the industry.

All this being said, it is a fascinating juncture to be in right now as the transportation and logistics industry is being disrupted across different facets through technology. Ten years from now, we can envision an industry which runs autonomous trucks on the road, shares data derived from its processes through blockchain networks, and utilizes artificial intelligence models to help optimize logistics of the future.

*Mike Valnev is CEO of Fleetpal.io.*



# **ALTERNATIVE DATA IN TRANSPORTATION**

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**DANIEL PICKETT**

**HEDGE FUNDS AND PRIVATE INVESTORS** are leading a new wave of innovation when it comes to new sources of data for making investment decisions. The conventional measures used to predict success of a company are fairly obvious: sales, expenses, leverage, and the other basic building blocks from freshman level Business Finance. The vast majority of investors get their information from quarterly financial statement releases. Some of the most savvy and successful investors have long sought to obtain information about the results of companies from less conventional sources, that can provide more real-time indicators of business activity. Alternative Data has many applications outside the financial world, and can help companies make better decisions from day-to-day operations up to long-term capital spending plans.

Alternative data can come from many sources both within and outside the target company (about whom the information is being sought). Rather than waiting for a company to announce its sales and expenses, an investor might go to a service provider to acquire anonymized/summarized data on credit card transactions, or number of unique cell phone pings inside a store. There are companies that sell custom satellite-based parking lot monitoring, as well as higher quality photos from light aircraft in more dense areas. There are categories of government data that are difficult, but not impossible to acquire, like Customs & Border Patrol import documents from ports. Data sets that are highly predictive of the total sales for a specific company can be very expensive, and even more expensive to lock down exclusive access. This effect is so dramatic, that a firm called CargoMetrics originally set out to be a data provider to hedge funds, interested in tracking the global supply of oil. The data-firm stopped selling data, and converted itself to a hedge fund backed by some of the largest institutional investors in the world.

The landscape of alternative data can be measured on three dimensions. The simplest is predictive power. If a number, such as “unique cell phone visitors to Best Buy” has an extremely strong correlation with total sales, then it is a highly valuable data set. It is very rare that any indicator offers such a silver bullet, though. Many of Best Buy’s sales come from online activity that isn’t captured by cell phones. Conversely, many of those cell phones that passed through the doors were just looking at a product in-store, before buying it online from the cheapest vendor.

Another key dimension for measuring the usefulness of alternative data is its timeliness. In the financial world, a company will make the results of its quarterly operations available to the public about 6 weeks after the end

of a quarter. That is 18 weeks delayed after the earliest activity, which might give some indication of market conditions. At the opposite end of the spectrum, an unidentified person/organization has been flying drones near Tesla's manufacturing plant, in an attempt to determine up to the minute production counts for the new Model 3.

The final dimension on which alternative data varies is fragmentation, or difficulty of collection. Highly fragmented industries, like trucking, where the largest players represent a few percentage points of market share, can be difficult to monitor. No single company has a large enough sample of data, to be representative of the entire national market, much less markets in which they have especially low share. Gathering detailed information on trucking markets requires a mosaic approach, where data from large companies might be combined with anonymized/summarized data from other vendors who have thousands of trucking carrier relationships. High fragmentation poses one of the most significant challenges in alternative data. Everyone with a piece of the larger puzzle wants to be compensated for contributing, but the information is only valuable after a significant number of pieces are collected and combined. This creates a tension between the

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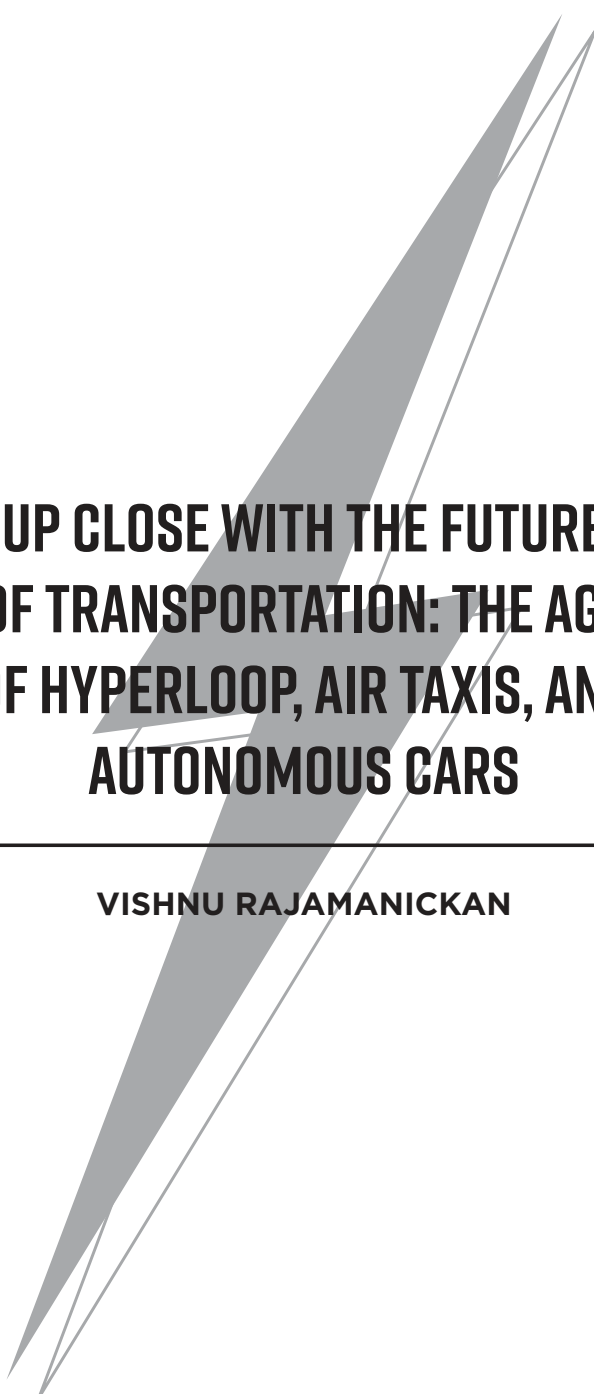
price of collection/combination/analysis, and the value of information once it is assembled.

Information about the supply and demand conditions for freight transportation in specific markets and lanes is highly fragmented and opaque. In aggregate, manufacturers, brokers, and truck/rail carriers hold millions of pieces to the puzzle. Where are all the power units? How shelf and temperature stable is the freight? What is the cost of operation (price floor) for all carriers available to move a particular load? How much difficulty are similar companies having moving freight at acceptable rates? Several venture capital backed startups, and a few traditional transportation service firms, are aggregating disparate data sets to answer questions like this.

The transportation industry is overdue for a wave of alternative data that is still in its infancy. Day-to-day pricing and routing decisions are the tip of the iceberg when it comes to potential uses for alternative data. Running large fleets, and developing warehouse space require immense capital investments. Timing can be everything for deciding to add new equipment, versus trimming new capital expense. Transportation data

absolutely reflects changes in business and consumer sentiment before government statistics like gross domestic product, unemployment and inflation. In addition to making our own industry more efficient, the alternative data produced by the transportation industry may become major economic bellwethers for national and global level economic forecasts.

*Daniel Pickett is chief data scientist at FreightWaves.*



**UP CLOSE WITH THE FUTURE  
OF TRANSPORTATION: THE AGE  
OF HYPERLOOP, AIR TAXIS, AND  
AUTONOMOUS CARS**

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**VISHNU RAJAMANICKAN**



**OVER THE LAST FEW DECADES**, technological disruption in the transportation industry has been sporadic at best, with the modes and mediums of transport largely remaining constant. But as the future beckons, we see visible interventions from a technological perspective as the societal consciousness of global carbon footprint, sustainability, and transit optimization are higher than ever.

Startups have mushroomed up in the transportation corridor, with ideas that not just advance the cause of technology in transportation but also develop novel business models that could help reduce traffic on the roads. For instance, the Mobility as a Service (MaaS) concept is increasingly gaining relevance in the cities of today, as it provides a way to remove traffic off clogged streets.

MaaS is a concept that persuades people to opt out of personal mobility vehicles and choose to look at transportation as a service to be used whenever needed. In essence, MaaS in its simplest form would essentially be public transportation options like a bus or a tram, but the idea could be extended now to bring in sophistication, making it more attractive.

Uberpool from Uber Inc. could be an excellent example. In the nascent stages when Uberpool was launched, the idea found little traction as commuters had to withstand many detours on transit, while the car drove around the vicinity to pick up more passengers. However, by using data points from its initial runs, Uber found a way to tweak its routing systems to drastically reduce detours, bolstering its MaaS solution and making it a viable alternative for people to use.

MaaS also does not restrict itself to ‘shared’ transportation that puts people side by side in a car, but could act as a business model where a car is shared over the course of the day by different people. Car-sharing service called Car2go in Germany experiments with this - cars from Car2go can be driven around by people and once they have reached the destination, it can be parked on vacant parking spaces, and can be taken out by someone else thereon.

## **AUTONOMOUS VEHICLES ARE THE NEXT BIG THING ON THE ROADS**

Of all the technological advancements in the transportation industry, the premise of autonomous vehicles is what holds maximum water. Then again, the idea of letting machines take the reins does not end with the development of the technology that drives it.

Self-driving vehicles could only exist in an environment that has set regulations in place and has distinctly defined liabilities extending from

the OEMs to the autonomous software development companies in case of accidents on the road. Also, legislation that governments would look to impose on autonomous driving must not be done proactively, as it could likely inhibit technological growth.

That being said, though autonomous driving is in a phase where companies are testing their vehicles on the roads, most of it is done under controlled and idealistic environments. For instance, places like Phoenix and Tempe in Arizona where a larger part of the testing is done, is known for its near-perfect setting—straight roads, minimal traffic, and year-long sunny weather. Accommodating autonomous vehicles across different environments with various driving complexities is a hurdle that companies would have to face ultimately.

Auto cybersecurity is another critical facet of having self-driving vehicles on the road. Security is crucial in an all-autonomous vehicle, as the driving software is subject to frequent hacking or malware attacks, which could lead to accidents or the loss of data. Hackers could also use the sensors on vehicles as surveillance devices, understanding the movement of people leading to burglaries.

Stretching the analogy, autonomous car hacking could also lead to besmirching the names of the OEM companies that manufactured it, potentially tanking the company's stock in the market and leading to hackers gaining off it. Though this sounds far-fetched, it really is not—a club football team bus in Germany was bombed by a man with motives that were not primarily about creating terror. Apparently, the man had shorted the stocks of the football club in question and was hoping that the incident would cause the club's shares to cascade leading to him earning on the market.

With autonomous vehicles, three factors are paramount to their success—technology, auto cybersecurity, and legislation.

## **VTOLS—THE SKY IS THE LIMIT**

The Vertical Take-off and Landing (VTOL) is a concept gaining steam, especially in cities that endure nightmarish situations on its roads. Developing countries around the world have cities that have flourished over the last few decades, leading to a migratory rush of people who have settled in with dreams of a better livelihood. Over time, the cities that were planned and built to host a specific number of people, have swollen to ten times its intended capacity, leading to anarchy on the roads at the peak hours.

In densely-packed localities where expanding roads or building new highways is not an option, VTOLs could be the ticket out. Though the concept of flying taxis sounds straight out of a Jetsons episode, it is a reality that some cities across the world have now been accustomed to.

The global VTOL market has over \$1 billion in investment now, with large airline companies like Airbus and Boeing in the fray. São Paulo, in Brazil, is one of the first places to adopt VTOLs after people found it hard

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AUTO CYBER-  
SECURITY IS  
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to navigate through the dense gridlocks of the city. Initially, the city had to make do with traditional helicopters that serviced people looking to get to the city center from the airport, which was a ten-minute ride away.

However, the costs were too high to be sustainable, with air taxi companies charging \$2,500 per ride, essentially asking people to pay for a full hour instead of the ten-minute usage. Voom, an on-demand helicopter service was launched by Airbus in São Paulo, with the intention of curbing such unreasonable rates. It ended up disrupting existing business models and has brought down the costs considerably. Electric VTOLs are the future, which is said to reduce costs even further, while making it more environmentally friendly.

### **AT THE SPEED OF SOUND—THE POTENTIAL OF HYPERLOOP**

What was unveiled as a theoretical concept in 2012 by Elon Musk, has now been taken up by several startups across the world, and is touted as a revolutionary way to shuttle passengers and freight. Hyperloop is a mode of transport that involves sending a pod through a vacuum sealed tube at around the speed of sound.

The Hyperloop Alpha concept was published a year after Musk mentioned it, and it envisioned the system to connect Los Angeles with the San Francisco Bay Area—a distance of 350 miles to be traversed in 35 minutes. The idea of hyperloop has spun off a whole new market, with startups like Hyperloop Transportation Technologies (HTT) and Hyperloop One racing against time to construct hyperloop tracks across the world.

Over the last year, HTT has successfully signed partnerships with France, UAE, and China, with a commercial track being built in Guizhou, China - the province which holds Alibaba, Amazon, and Apple offices in the country. Hyperloop One, has already built a 500-meter test track in Las

Vegas and has publicly stated that it would be delivering a fully operational hyperloop system by 2021.

Though track construction is going on in full throttle, the promised theoretical speeds have never been met. The fastest hyperloop pod speed reached to date is around 300 mph, which is less than half of what was theorized by Musk. Nonetheless, there seems to be progress and the yearly Hyperloop Pod Competition conducted by SpaceX in California could help achieve the target.

Technologies like these help further the boundaries of transportation, and excited investors at the helm would hopefully speed up the development process. However, it remains to be seen if futuristic technologies could pique the collective interests of the society, especially since affordability and business models play an important part in it. But if marketed right, and if the technology is on the dot, they could well turn out to be the ‘Macintosh’ of the transportation industry.

*Vishnu Rajamanickan is a staff writer for FreightWaves.*



**THE SOCIAL IMPACT OF  
COORDINATING CLOUD  
COMPUTING**

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**MICHAEL CARMODY**

**IT'S NOW A MODERN PHENOMENON** that plays out across television and internet screens across the country from all corners of the world. Natural disasters are raging on every continent stretching resources to the breaking limits and stressing the supply chains of NGO's, non-profits and governments reacting the unexpected devastation.

The world watches as Mother Natures wreaks havoc across communities forever scarred with harrowing tales of destruction and survival. Unfortunately, we collectively often hold our breaths as organizations of volunteers of every skill level rush in to save any survivors, then the donations pour in from the generosity of fellow humans worldwide.

When these events hit home domestically in the USA, they can directly impact freight markets from Seattle to Miami, especially in America's largest logistic hub cities. Many of today's trucking and logistics companies are using modern technology to track and trace shipments in their network from pickup until a load is delivered, even until the carrier or driver gets paid.

Almost every company offering logistics today in the USA is using some sort of technology platform(s) to organize and optimize their team's human support effort and their precious client data. Technology solutions are pervasive today in our industry and widely available in desktop, mobile and cloud versions to meet every taste.

More and more we are also seeing a movement across the country with logistics professionals aligning with non-profits and NGO's to provide direct and indirect support to all sorts of organizations designed to give back to some community. Often these organizations are strapped with operational budgets that cannot react to events happening in more than one location.

Observing the amount of effort and planning to get aid to the impact zone and collaborating without technology can lead to logistic bottlenecks and mis-directions that tie up equipment, burn up money, and worst of all: waste people's time and good will. Similar heart burn can be felt when government funds run out in an impact zone leaving citizens looking to local non-profits to step in as the primary aid provider for the rebuilding stage. Depending on the location, the volunteer's skill level with logistics best practices and process control can be overwhelming.

In recent news, some aid items were found spoiled in a trailer in Puerto Rico, never making it to their intended community from the generous donors who organized that load of goods. The early and understandable response from the non-profit world is to focus donations in cash that can be

allocated quick and easy without the hurdles that come with physical good donations, overlooking the obvious root cause that no one was tracking that load like a logistics professional ensuring a proof of delivery was signed and the trailer unloaded, so the driver can get his next dispatch.

As we look to the future of social impact collaboration in the logistics space, there seems a natural market need for technology firms to empower NGO's and non-profits with software donation programs and access to education resources. With affordable logistics software via web and mobile solutions that already exist for the private sector for existing transportation supply chain organizations that are looking to support a coordinated data model that allows NGO's to plug in with the same or similar tools, locally, regionally or globally to participate with supply chains already in place.

Any future public/private data model will have to be tested in the live arena before any kind of mass adoption can be considered. Let's cast an eye to those organizations that are blazing the trails in the disaster relief in today's real time response zones without any enterprise TMS, FMS or WMS tools. Let's envision a future where the 'Freight.Tech' leaders can get them enabled with the tools that connect digitally and compliment their existing internal technologies toolkit. The public/private model must be simple to integrate in order to get any kind of adoption rate that can leverage the global impact of thousands of non-profits shipping cargo like the professionals from their smartphones.

Ultimately, a few of my friends and colleagues have joined together with a vision to bring modern technology and industry know-how to the non-profit sector, we call it: Karma Delivers.

Our goal is to establish a collaborative 'best practice' toolkit for working together with the transportation community to have donation and aid shipments moved through existing freight networks with the costs covered by the online donor community for a sustainable business model. Working with the established carrier and forwarder community ensures the physical goods will be handled like any other by a logistics professional in any country.

This platform can empower thousands of aid organizations who can then participate in more impact zone response campaigns and stronger planning preparation programs thinking ahead of the next natural disaster and not worrying if their load of aid will ever make it to those that need it most.

*Michael Carmody is co-founder of Karma Delivers.*



# **SEA CHANGE IN SHIPPING**

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**MIKE ANGELL**



**THE CONTAINER SHIPPING INDUSTRY** is on a steadier course this year following a tumultuous 2016 and 2017. But ocean carriers still face choppy waters and are looking for ways to right the ship.

The previous two-year period was marked by severe over-capacity that caused ocean freight rates to sink below break-even levels.

The bankruptcy of South Korea's Hanjin left many beneficial cargo owners and freight forwarders with containers stranded at sea.

Surviving carriers were forced to merge in order to stay afloat. Maersk bought Hamburg Sud for \$4.3 billion, Hapag-Lloyd bought United Arab Shipping Company, and China's Cosco acquired Overseas Orient Container Lines.

Along with the merger spree, the major carriers formed vessel-sharing agreements that coalesced into three major alliances - 2M, The Ocean Alliance and THE Alliance. These arrangements allowed the carriers to share vessel space and information as they sought to fight over-capacity and weak freight rates.

Despite those moves, the proper supply-demand balance continues to elude the containership industry. Industry researcher AXSMarine says in-service container shipping capacity is expected to grow 5.8% through the second half of 2018.

But in the first quarter of 2018, global container demand growth was 4%, according to Maersk, compared to a 5% growth rate seen over 2017. The world's largest shipping line said the slowdown "represented a weakening momentum of the global economic environment, driven by soft global retail sales." The slowdown also forced Maersk to lower its earnings guidance for the year.

Exogenous shocks are also hitting the industry, particularly due to the strong recovery in fuel prices. CMA-CGM, the fourth largest ocean carrier by capacity, reported a \$77 million loss in the first quarter. While container volume rose a healthy 15%, a 19% rise in fuel costs pushed the company into the red.

Rolf Habben Jansen, the chief executive officer of the fifth largest carriers Hapag-Lloyd, said the first half of 2018 saw "increasing fuel costs . . . and a slower than expected recovery of freight rates." This as the company reported a \$101 million loss for the first half.

The alliances continue to make cuts to services, particularly in the trans-Pacific market, to adjust the ever changing needs brought on by trade wars and changing trade flows.

But still AXSMarine says the industry may have to idle up to 3% of capacity, amounting to 750,00 twenty-foot equivalent (teu) in ships, so as to come closer to a better market balance.

And the threat of oversupply always looms, particularly among state-sponsored shipping companies in Asia. Overseas Orient Container Lines (OOCL), which is now owned by China's Cosco, plans to increase its capacity from 700,000 teu to over 1 million teu, according to a statement from chief executive Huang Xiaowen.

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Among all container ship companies, total capacity on order for 2019 delivery amounts to another 1 million teu, representing over 4% of current shipping capacity.

Moreover, the industry's drive for economies-of-scale is causing more oversupply within different ship segments. The increasing use of ultra-large container vessels, those above 15,000-teu, is threatening to push ships below that capacity out of major trade lanes, such as Asia-to-Europe. But other trade lanes such as Asia-to-US East Coast are not yet ready to absorb the ultra-large container vessels.

In addition to constantly managing capacity, the container industry also faces another major upheaval in 2020. By that year, ocean carriers are expected to follow a global mandate to reduce the sulphur emissions from ship fuel from a current level of 3.5% to 0.5%.

The trouble is that many container lines are still working through how that can be accomplished, whether through the introduction of low-sulphur marine fuel, the installation of sulphur scrubbing equipment on ships, or using entirely new fuels such as natural gas.

With plenty of capacity on the water and more expected in the coming years and an uncertain regulatory environment, the industry's main initiatives in the last year have been in furthering their technology efforts. The moves aim to reduce overhead costs as well as differentiate carriers in an otherwise commodity service.

"Digitization within transport and logistics means seamless service to our customers, visibility in the supply chain and driving a more efficient business," said Maersk chief executive Soren Skou in a Wall Street Journal op-ed earlier this year. "Customer trends are changing in a way that calls

for new logistic services where you can customize your service instead of having to fit in to a generic product, decided for you by others.”

After a nearly two-year incubation period, Maersk offered up to the broader industry its blockchain collaboration with IBM. Dubbed TradeLens, the set of APIs and protocols will allow shippers, carriers and logistics companies to build applications to streamline the labor- and paper-intensive process of booking container freight.

Beyond blockchain, Maersk also teamed up with China e-commerce giant Alibaba for online freight booking on Maersk container ships. Maersk’s freight forwarding subsidiary Damco also launched an online platform for booking cargo space.

Not to be outdone, CMA CGM has also been investing heavily in technology. Earlier this year, it announced plans to fund an international start-up incubator, called “Ze Box,” which would provide funding and support to start-ups in the logistics and transportation sector. CMA CGM is also seeking to capitalize on increasing trade in fresh foods, with containers designed for better transportation of liquids and seafood. Hapag-Lloyd too is introducing its own online freight quotation system to ease the process of booking freight on its container lines.

The efforts come despite shipping’s reputation as one of the most staid and technology-averse industries in the world. But with profit growth still iffy, shipping companies may find the best, and cheapest bet, will be on digital bits, rather than steel.

*Mike Angell is a maritime specialist for FreightWaves.*



**LESSONS FROM UNDERDOGS:  
HOW TO LEVEL THE PLAYING  
FIELD AND WIN THE  
LOGISTICS GAME**

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**CHRIS RICCIARDI**

**IN THE 2018 WORLD CUP, CROATIA**—a tiny country with a population of only 4.3 million—made it to the finals despite having all cards stacked against them. Small countries rarely reach the finals, yet Croatia defied the odds, won game after game, and made history.

The sports world is full of underdog stories like this—from the 1980 “Miracle on Ice” Olympic hockey game in which Team USA’s scrappy team of mostly amateur players defeated the battle-tested Soviet Union squad; to the 2017 Super Bowl where the Philadelphia Eagles won their first championship ever against the New England Patriots, the NFL’s greatest dynasty. Sportscasters and fans alike often tout these wins as miraculous, focusing on all the reasons these teams shouldn’t have succeeded—whether it’s lack of experience, size, budget, or something else. But often, victory is not a miracle at all. There is a perfectly logical explanation for why these teams emerge as winners.

In both the sports world and the business world, success doesn’t automatically come to those with the deepest pockets or best talent available. Companies that experience continued, repeatable success know it doesn’t just happen by chance.

### **LIMITED RESOURCES FORCE CREATIVE SOLUTIONS**

Let’s take a closer look at Croatia’s 2018 World Cup success. One distinct advantage they had over opponents was their mentality. Croatia is a country that has been plagued by Civil War, and many of the team’s players grew up in unstable economic conditions. With deprivation comes improvisation; those who are used to working with limited resources quickly learn to do more with less and find their strengths in other forms. This mentality often breeds creativity, perseverance, and the ability tackle challenges better than opponents because the stakes are higher.

Small businesses in the logistics space can use limited resources to their advantage by working smarter, not harder. Companies don’t need to build the best proprietary technology or hire top industry talent to compete, but they do have to use what they have wisely. In the 3PL world, the sales process is time consuming and involves several steps: prospect customers, analyze their needs, research cost, research sell rate, respond to quote requests, source the load, etc. Efficiency and revenue per employee are stagnant and turnover is common. What if brokers could buy and sell more efficiently and accurately? What if sales reps could talk to more customers per day, with fewer phone calls, mouse clicks, and keystrokes? Even shaving off just a couple seconds per rep, per day could have a big impact

over time. By focusing on efficiency gains driven by a smart application of data and technology, companies can outperform their larger competitors with less effort.

### **DATA SCIENCE CAN ACT AS A FORCE MULTIPLIER**

Out of all the sports underdog stories, one of the most impressive is the Leicester City win in the English Premier League during the 2015-2016 season. Leicester did not have the most talented or experienced players, and their track records for possessions, passes, and penalties were some of

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the worst in the league. Yet, they defied 5,000-to-one odds and won the championship. How? They hired an innovative sports science and medical team that leveraged data to improve performance and reduce injuries. For example, they collected data on injuries and were able to identify and bring overloaded players off the field at just the right time. A culture of data-driven decision-making is still a large part of the team's strategy today.

Data analysis is similarly having a huge impact on logistics operations. Deployed correctly, technology can be used as a force multiplier to empower a small freight brokerage to execute and perform like a much larger one. For example, machine learning technology can aggregate data, identify patterns, and essentially “learn” as feedback is continuously added to the system. Smart pricing platforms can automatically

adjust rates based on mileage bands, upcoming holidays, or market conditions and help users select the best transportation mode based on the customer's needs.

### **LARGE PLAYERS SHOULD TAKE ON A STARTUP MENTALITY**

Though a creative application of resources and innovative technology can lead small and emerging businesses to victory, that doesn't mean large industry players can't also find creative ways to fight back. For example, the concept of the “digital broker” has emerged in recent years, with many technology-focused transportation startups being labeled as “Ubers for Freight.” These companies have flashy websites and mobile apps that promise sophisticated carrier matching and automated pricing.

Legacy logistics companies that embrace big data should not be afraid of these newer startups because they likely have access to the same information—it's just that they aren't connecting the dots as well. With the right algorithms and integrations, established companies can also offer sophisticated carrier matching and automated pricing—perhaps better than digital brokerage startups because they have the added advantages of industry knowledge and deeply established relationships.

Whether it's speed-to-market when rolling out a new product or service, responding to quote requests faster, or shortening the internal learning curve for employees, companies that think outside the box and leverage data in new ways will have a competitive edge and emerge victorious.

*Chris Ricciardi is chief operating officer of Logistical Labs.*

**AS MUCH AS  
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THEY MUST.**

**BRIAN STRAIGHT**



SECTION TWO

# BLOCKCHAIN IN APPLICATION

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02



**THE HARD PART: MOVING PAST  
BUZZWORDS**

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**BRIAN GLICK**

**BUZZWORDS...AI, BLOCKCHAIN, ANALYTICS,** Big Data, and on and on and on. You can't go to an industry event or a vendor demo without being bombarded by them. Much like the market, the dominance of these buzzwords rises and falls. Some are penny stocks and others will become blue chips, so transformative to our businesses that we won't remember how we survived without them. Can you imagine running a business without the hottest buzzword of 1876, the telephone?

Most will land somewhere in the middle. They'll become part of the fabric of our organizations, finding their niches. They won't deliver on all of their promises, but they will likely do more good than harm.

Also like the markets, the prognosticators will tell you that they can pick the ones that are going to "win" and the ones that will "lose". The helpful pundits will share thoughtful analysis weighing pros and cons, putting you in a position to decide within the context of your business. The snake oil salespeople will yell at you from the stage, spreading FUD (fear, uncertainty, and doubt) and FOMO (fear of missing out) until they think they've trapped you into buying whatever they're really selling.

There's a topic, however, that you won't hear a lot about. It's complicated and hairy and hard to package into a conference talk. It doesn't drive clicks from a LinkedIn post, and it certainly isn't sexy. That topic is integration. More specifically, answering questions like "How do I integrate this new technology into my business?" or "How can I use these tools to actually improve my business processes (and bottom line)?" or "How can I make sure that I'm using technology to bring value to my customers (and not just my vendors)?"

As a technology vendor, advisor, and thought leader, you might think that my answer to this would enthusiastically be, "Buy more technology! Here's a piece of software that will magically make all of these problems go away!" The reality is much more complex and much more subtle. Technology (including our wonderful cloud integration platform) definitely plays a role, but it's merely a tool.

The real answer (and you're probably not going to want to hear this) is to do the same basic blocking and tackling that you do for every other part of your business. You start by being thoughtful, then add a dash of pragmatism, and finish with a whole lot of hard work.

#### **STEP ONE: BE THOUGHTFUL**

When we work with our clients to help them understand how to use technology better within their organizations, we start by understanding

why we're sitting around at the table in the first place. The answer is always to change something. What's not always clear is the definition of what we're trying to change. The change may be a few levels deep.

For example, you would never go to the hardware store and buy a hammer because you want to bang it against things. You buy a hammer because you want to put a nail in the wall. You want to put a nail in the wall because you want to hang a picture. You hang a picture because you want to remember your vacation. If someone said to you that they had a great way to show pictures of your vacation on the wall with a pin sized projector, you might not buy the hammer at all.

I hope you wouldn't call up a software company and say, "I want to spend a million dollars and 5,000 hours to implement an AI thing." That would be starting with the hammer. Start with a problem: cash flow, fuel costs, sales velocity, gross margin, whatever is personally relevant to your business. Once you have the problem stated, then (and only then) move to the next step. In my opinion, the vast majority of failed IT projects fail at step one. We see the symptoms of the failure at the end, but that's just a building crumbling from a shoddy foundation.

## **STEP TWO: BE PRAGMATIC**

Now that you know your problem, it's time to go buy that new buzzword rich fully-managed quantum-ready, 12-cylinder, mega tool, right? Everybody else has one. You're going to be left behind. Let's get going. Install it yesterday.

Nope.

The next step is to figure out if you already have the tools to solve your problem. If you don't, then is there an established, proven tool that can help? If not, are you willing to take the very significant risk of attacking a buzzword heavy project?

As much fun as buying the new shiny gadget is, we all have to remember that change is hard. Moving the people in your business towards new business processes and continuous improvement is always an incredibly heavy lift. If you can de-risk the project a bit by using the tools you're already familiar with, then do so. If you can't, then look for a technology stack that has been successfully implemented elsewhere. Let someone else make the mistakes (and eat the cost overruns).

If, and only if, you can't find an existing solution in your toolkit or someone else's, then go ahead and see if the new buzzword can help.

### STEP THREE: DO THE HARD WORK

Implementing new, unproven technology is amazingly hard. Donald Rumsfeld put it best, “there are also unknown unknowns – the ones we don’t know we don’t know...that tend to be the difficult ones.” Projects full of new technology are overflowing with unknown unknowns. Will this work with our existing business processes? Can it support our volume? Will it work at all? Will we deliver on time and budget? Actually, I can answer the last one... you won’t.

So how do you mitigate all of this risk? You double down on de-risking the rest of the project. Squeeze the scope down to the minimum. Use your best project manager. Double your committed timeframe (then double it again). Double the number of status meetings. Pick a business problem that you really understand. Essentially, control all of the other factors in the project, so the new tech is the only major risk point. Once you understand the tech, then you can apply it to more complex and risky business problems.

UPS recently made a great example of this. UPS operates about 119,000 vehicles worldwide. When they recently announced a pilot with Thor for their electric trucks, they set the scope at 2. That’s 0.002% of their fleet size. If you can implement new tech with a 0.002% scope size, then go for it. You can always grow from there.

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At Chain.io, we created a production-caliber blockchain project called Vault that our clients are using to deliver real world business value. How did we get to production with live customers while many companies are still “ideating”? We applied the steps above.

First, we thought about a real problem. In our case, it was a situation that a client had with an auditor where they were unable to prove that an Excel file hadn’t been modified between the time of shipment and time of audit.

Next, we got pragmatic. We looked at the existing document management solutions in the marketplace and determined that none had the exact properties of immutability and independent verification that we needed to solve the problem.

Finally, we de-risked the heck out of the project. We knew that our major risk was the blockchain implementation. Our initial designs had

APIs and reports and fancy screens and all sorts of cool stuff. We cut all that crap out. One file, one secure FTP server, one pilot customer. We could (and did) expand the scope later.

So how did we do? The project took us 25 times longer than our original internal estimate. It was immeasurably harder and (measurably) more expensive. It also went to production and the business users at our first client gave us a perfect score on the launch project.

The reason it was so successful? We were thoughtful, pragmatic, and we put in the work. If you're ready to move past the buzzwords and attack new technology, make sure you're ready to do the same.

*Brian Glick is founder and CEO of Chain.io.*



**ELIMINATING FRAUD THROUGH  
BLOCKCHAIN RECORDS BASED  
ON OPEN STANDARDS**

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**JAMIL DEWJI**

**BACK IN THE SUMMER OF 2011**, the FBI launched an investigation after learning that a truckload of beef was stolen from an Amarillo, TX meat packing plant. The theft occurred when someone, who had stolen the identity of a legitimate trucking company, picked up the load from the plant but failed to deliver it to its intended destination in California. When finally arrested, one of the thieves was discovered to possess a fake commercial driver's license that listed the Mexican Consulate in Sacramento as his address, as well as a real driver's license registered to a woman.

Stories like this are not uncommon. In fact, they have become increasingly frequent. 28 similar cargo thefts occurred between April 2011 and February 2013. The cargo value for each theft: \$30,000 to \$200,000. Now imagine if all truck drivers carried blockchain-based identification that shippers and receivers anywhere in the world could easily verify through the click of a button before releasing or accepting cargo. That is Learning Machine's long-term vision for blockchain in transportation: cryptographically secure identity documents that eliminate identity fraud, double brokering, and even lost paperwork headaches across the supply chain.

The world already has an open technology standard to do this — Blockcerts. Blockcerts is a free open source toolkit for any shipper, carrier, or industry participant to build their own applications for issuing and verifying official records. The standard enables documents to be anchored to a blockchain and independently verified without any dependence on a particular carrier or government institution — for example, the FMCSA — to own and continually verify them.

Learning Machine joined the Blockchain in Transportation Alliance (BiTA) because it is clear that this group shares our vision of an industry built on open technology standards. This is also why we are so excited to participate in the BiTA Driver Marketplace Think Tank and Blockchain Interoperability Technical Committee. These working groups not only serve as incubators for the future, helping industry stakeholders uncover common pain points and challenges, but they are also the ideal forum in which to raise awareness about the capacity of the Blockcerts open standard to serve as a verification infrastructure for all kinds of transportation records — bills of lading, insurance documentation, and driver identity.

BiTA's commitment to open standards and interoperability makes it unique among technology standards bodies. The problem with similar standardization efforts is that they are often driven by technology companies with their own commercial goals in mind. These standards quickly become



proprietary, and the same companies that participated in their development end up having to pay someone else to license them. That's why Learning Machine is committed to keeping its enterprise software Blockcerts compliant. This means there's no Blockcerts blockchain you have to use; you're not stuck with any one vendor's blockchain solution; and you can use multiple backup blockchains in case one of them goes away over time. After all, it's still early days. No need to pick a winner now — it just makes sense to use a standard that can work with whichever chains gain adoption.

The road to blockchain-based universal driver identification inevitably passes through the intersection of government and business. Today, a driver's CDL, DAC records, MVRs, drug tests, medical history, and employment history are maintained by government agencies like the state motor vehicle department, which issues driver's licenses, and the Department of Transportation Federal Motor Carrier Safety Administration (FMCSA), which manages safety and medical certification. Carriers, individual drivers, and industry service providers can access these records from federal or state databases, but often for a fee, and you have to know some of the driver's personal information already.

This is where BiTA has the opportunity to leverage its status as an industry heavyweight to advocate for the individual data ownership, privacy, and independent verification benefits that open standards provide for everyone in the records issuing and verification ecosystem. BiTA can also be instrumental in identifying near-term, mid-term, and long-term use cases for Blockcerts in transportation that serve as valuable proofs of concept.

Insurance documentation is the most likely place to start. Blockcerts-based proof-of-coverage would help insurers, the insured, and enforcement personnel verify insurance in real time, all but eliminating the need for paper. For drivers, the real benefit comes from the ability to easily share insurance information with other drivers after an accident. Manually exchanging carrier information, phone numbers, and cards is far too cumbersome and unreliable. Not only does blockchain-based proof-of-insurance make verifying a driver's insurance information easier, but the immutable nature of blockchains makes it nearly impossible for drivers to tamper with that information, virtually eliminating the ability to commit insurance fraud.

Employer assessments form a strong mid-term use case. Through metadata built into digital records, employers can issue drivers new credentials right now that link to past assessments from previous

employers, forming a chain, or “stack,” of employment histories and achievements. Blockcerts can also be parsed by any system that can read structured data. This means it’s easy to automate verification and screening of records without needing to buy special software. An IT system using a Blockcerts-compliant verification service could effectively screen new driver applicants and candidates in a matter of seconds. The driving record could then automatically release rewards for good performance, perhaps based on “smart contracts,” to better incentivize and motivate drivers.

A compelling long-term use case exists in transportation financing: receivable factoring and insurance underwriting. Those same driver credentials and metadata features could help drive down premiums by extending risk management and credit worthiness to the driver level. This means lenders can now assess individual drivers rather than having to take a guess based on an entire fleet. In addition, these factoring and insurance companies could monetize their time consuming and labor-intensive assessment efforts by issuing creditworthiness certificates to carriers for a fee, creating an entirely new revenue stream. For smaller carriers and owner operators, lower premiums mean greater ease of doing business and improved access to the short-term financing they need to pay off critical costs like office rent and driver salaries.

By 2020, most companies and governments will be using the blockchain in some way for verification of claims. Centralized databases have some utility, but as they get bigger, both security and monopoly risks multiply. As the foremost leaders in trucking and technology, we are now at the exciting historical moment when we get to choose what our future will look like. The main question we have to answer now is, will we go with a solution that privileges ownership of data and vendor independence, or will we choose solutions that give ownership of our data over to yet another series of vendors? Everyone who chooses an open standard makes the transportation industry more efficient, safer, and empowering for everyone else. Blockcerts is a public good that creates a global ecosystem of truly interoperable, enduring digital records for all.

*Jamil Dewji is director of sales operations at Learning Machine.*

An abstract graphic design featuring a central vertical axis. At the top and bottom are large gray squares. A horizontal line bisects the design. The title and author's name are centered on this line. The design is composed of various gray and white geometric shapes, including squares, rectangles, and lines, creating a layered, architectural feel.

# **SECURITY IN A DATA-CENTRIC WORLD**

**BRIAN STRAIGHT**

**NOT SO LONG AGO, BEFORE THE INTERNET** – if anyone remembers that anymore – business was done the old-fashioned way, with a handshake and a smile, or maybe a phone call or fax. It was about personalization. Maybe it was more than just a few years ago, but when compared to the speed at which commerce is transacted in 2018, it might as well have been 1918.

The point is, the world has changed. That’s not something anyone in business doesn’t already know. Some still prefer to handle transactions with that personal touch – it may no longer be face-to-face, but you can be sure each party knows the other’s kids’ names. There is still a place for this kind of interaction in the world, and dare I say, maybe a need for a little more of it.

Increasingly, though, our transactions are being handled in bits and bytes, and we never see the party on the other end, let alone speak to or, in some cases, even know who it is. All we know is that transaction number 104285 has been successfully completed.

That’s progress. I think.

Whatever you think of the march towards greater use of technology in business, it’s arrived, and it’s ever-growing. For those in the transportation industry, consider how much data your business is generating on a daily basis. According to Domo’s Data Never Sleeps 5.0 report, 90% of the world’s data has been generated in the past 2 years, and the daily pace is quickening. Right now, more than 2.5 quintillion bytes of data is created each day globally, and your business is contributing to that.

How?

Nearly everything you do in your operation is now done on a computer. Do you own trucks? Chances are, if they are newer models, they are connected to the cloud and producing thousands of data points every minute – everything from the health of the engine to GPS coordinates to driver’s hours of service compliance through an ELD. It’s all being recorded.

That is data for which you, in many cases, are responsible. The truck manufacturer may have some responsibility, and your software provider may have some responsibility, but ultimately, if something happens to that data, your customer is coming after you.

How do businesses feel about their data, and more specifically, their data security? According to a FICO survey, 68% of business owners feel they’re prepared to fend off a cyberattack. In general, smaller businesses – which still make up a majority of the trucking fleet population – are quite confident they are safe, with 82% believing they are not at risk of a data breach. That means only 18% think they could be targeted, yet the same

survey asked whether they had controls in place to prevent a data breach, and 23% said they did not.

Every day, businesses around the world are targeted by cyber thieves. Why? Because there is so much data to be mined, and it has value. Remember all that data your operation and vehicles are generating? Add to that all the data you are collecting from customers, including billing information and even account information. Thieves want that data.

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—

Container line Maersk was hit by a cyberattack in 2017 and it affected operations for weeks. It also cost the company close to \$300 million in losses. FedEx's TNT subsidiary was also hit in 2017. The eventual cost? At least \$300 million.

Those are large company examples that you would expect to have had some level of security, and yet they still fell victim. If you are a smaller company, are you really safe? A single cyberattack could be substantial enough to shut down your business – for good.

As much as businesses might not want to think about cyber security, they must. And it doesn't matter what size business you are. You can't protect your data with Joe the Security Guard, even if he is 6-foot-8 and 300 pounds. Fortunately, there a number of trends in security that are working in favor of the smaller enterprise.

As more people have become concerned about data security, new measures and regulations have been popping up. You used to be able to just log into websites, but some now require 2-factor identification that includes texting a code to a pre-set number. Enabling added layers of security is a simple way to help protect your business. In Europe, regulators created the General Data Protection Regulation (GDPR). This complex legal hoop has promised to tighten security, although it also has created plenty of headaches for companies.

There are other options being developed that can help many businesses, especially the smaller trucking companies and shippers. These include cloud-delivered security. Products that take advantage of the cloud are able to adapt quicker to new security threats – no more IT worker going from computer to computer in your office to install patches for the latest virus only to do it again the following week.

Two other trends that are growing and will become increasingly popular in the next few years are machine learning security and blockchain-based security.

Machine learning offers the chance to identify anomalies, which is exactly what cyberattacks are. The reason they are successful is that we – meaning humans and computers – have been unable to identify those anomalies quick enough to stop the threat before it infects a computer. Machine learning is expected to be able to identify these quicker by “learning” what normal behavior is for your computer. Once it has a blueprint, anything out of the norm could be flagged until human intervention confirms it is safe to proceed.

There are plenty of issues that need to be worked out before machine learning can become a main defense of cyberattacks, but many experts believe that cyber defense products will be regularly based on machine learning by 2025.

Blockchain may provide the best opportunity to fight back against cyber thieves, and in some cases, the basic principles of blockchain’s decentralized approach are already starting to take hold in technology solutions. Blockchain uses a distributed ledger to verify transactions across multiple computers. If the majority agree that the transaction is a valid transaction, it is allowed to continue. If not, it stops it right then.

Switzerland-based technology company Acronis is already using blockchain to create a prototype cyber security solution. Acronis provides backup, disk management and disaster recovery services. The company says that blockchain prevents accidental and malicious tampering or alteration of data from going unnoticed and creates an audit trail for all stored data. The solution includes continuous monitoring for file integrity and generates alerts if there is a discrepancy.

Data security remains a concern for businesses of all shapes and sizes yet remains an afterthought at so many. As more and more data is generated, the chances grow that your business will be affected. The good news is that the solutions available to protect your business are expanding at a rapid pace, offering hope for the immediate future. Hope that goes beyond Joe the Security Guard.

*Brian Straight is managing editor of FreightWaves.*

**DISRUPTION  
IN THE  
FREIGHT  
INDUSTRY IS  
HAPPENING.**

**BRUCE MCGONIGAL**

**SECTION THREE**

# **AUTOMATION & THE SUPPLY CHAIN**

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# **LIGHTS-OFF LOGISTICS: USING AI AND ADVANCED ANALYTICS TO AUTOMATE SUPPLY CHAIN DECISIONS**

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**GREG PRICE**

**THREE KEY CONCEPTS:**

- Consumer expectations, aging technology, lack of transparency, and vendor compliance are stressing supply chain performance and increasing costs.
- Only those companies that can measure and analyze supply chain data while managing and predicting performance will have an operational and competitive advantage.
- Using advanced techniques such as machine learning and statistical processing can be applied to drastically improve shipment execution and balance service level, vendor risk, and cost.

The rise of E-commerce and the increased level of service expectations have transformed the landscape and operational practices of many companies in the grocery, retail, consumer packaged goods, and home goods spaces. This has led to added stress on the capabilities of existing transportation providers and 3PLs and has spotlighted the weaknesses in this system that were at one time hidden by demand and outdated systems. Those companies that have invested significantly in talent, operations, advanced

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—

analytics and technology are enjoying outsized gains in performance and competitive advantage while everyone else is getting left behind.

As a consultant at McKinsey & Company, I helped many Fortune 500 companies identify opportunities to improve performance, efficiencies, and velocity and ultimately change the DNA of their supply chains. Surprisingly, less than 10% of the companies I consulted for leveraged any type of advanced analytics or automated decision making to run a competitive and high performing supply chain. On top of that, a large majority are utilizing disconnected and aging software platforms that fail to change at the speed necessary to maintain the ever-increasing demands of customers looking for a transparent and a delightful experience. This disconnect has led these organizations to have difficulties in measuring and analyzing the basics, namely, spend, performance, operational capabilities, and customer needs. This taught us that trying to automate supply chain decisions with machine learning algorithms wasn't going to work for these companies and we needed to start with the basics. We learned, that in order

to fix this problem, we needed to drastically improve the data infrastructure, enrich existing supply chain data, and create the data pipelines necessary to apply automation and advanced analytics.

At Shipwell, we believe that every company can have a world-class supply chain. Complete with visibility, automation, and the capability to deliver a delightful and transparent experience to customers. To support this goal, we are working towards a world where a company can do this in an extremely automated way, in what we call “Light’s off Logistics.” This means that a company’s supply chain is closely coupled with its order entry, warehouse, ERP, and transportation systems where software intelligently builds, routes, and manages shipments and automatically solves low level exceptions using advanced analytics, reinforcement learning, and temporal-spatial workflows. For example, our current technology can measure service level, risk, cost, and vendor capabilities to automatically route and improve efficiency and performance. Coupled with temporal-spatial events, we can start to further improve the level of automation to drastically decrease the amount of intervention and touch time. This leads to improved customer response times and service levels. For instance, a lost or damaged shipment can quickly get identified, and the system can send a replacement, or dispatch a last-mile carrier to handle the complete return for the customer on the fly. We can help a manufacturing or pick line automatically build, schedule, and load a palletized shipment while notifying the consignee of estimated arrival time. This will be the future of freight and shipping.

We’ve invested a tremendous amount of time and effort researching and delivering automation solutions to the over-the-road trucking segment and believe that these solutions will become widespread in the next 5 years. Additionally we believe that with the decreasing costs of cloud computing, mobile and IoT sensors, and distributed GPU systems, these capabilities will be affordable and ubiquitous to companies that have small or large footprints. Also, the computing power required to solve complex machine learning and reinforcement problems and execute those algorithms in production is increasing at an exponential scale. GPUs, which have typically been used to train deep learning models and networks—what many people consider AI—have increased in speed by 500x in the last 5 years and 10x in the last 6 months. This means that computing power necessary to solve these difficult automation, classification, and optimization problems will be more computationally feasible and move from operations research problems to feasible and productionized where supply chain decisions

can be made “Lights Off.” However, these automated solutions will still require intervention by people as the physical movement of goods results in various exceptions and the vast majority of supply chain systems are disconnect and aging.

We are at the most profound change in the shipping and freight industry since the advent of EDI or the shipping container. Supply chains will go from disconnected, fragmented, and archaic to highly automated and connected. Not because suppliers wish to completely change their “IT” infrastructure, but because their business will not be able to complete with those that invest heavily in talent, technology, and advanced analytics. It will be the only way to compete in an environment where consumer preference forces excellence.

*Greg Price is founder and CEO of Shipwell.*



**AN INDUSTRY ANALYSIS: HOW  
CLEARLY ARE WE SEEING  
TOWARD THE FUTURE RIGHT IN  
FRONT OF US?**

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**SAHEJ SINGH**

**THE GENERAL OUTLOOK OF THE LOGISTICS** and freight industries is met with mixed emotions. Some are excited about the many benefits technologies like electronic logging devices (ELDs) can have; trucking firms could, for example, gather real-time alerts on vehicles through the utilization of geofencing and, in turn, use that data for a higher level of business intelligence and strategic planning. Such technology could, amongst other things, be used to identify risky driving behaviors early in the hiring cycle which would serve to lower insurance premiums quite significantly for logistics firms. “If used right, these types of existing technologies could lead to hundreds of thousands of dollars saved over the lifetimes of some of our clients,” affirmed Chad Eichelberger, president and COO at Reliance Partners.

In contrast, others meet the pending technological disruption in the industry with a foreboding sense of anxious anticipation. With Tesla successfully engineering a semi-autonomous electric Class 8 truck, to Uber Freight enabling firms to broker freight deals via mobile application and Amazon aiming to become one of the most dominant logistics firms in the world—it’s understandable that some would be nervous in their outlook of being able to adapt to an industry landscape as poised for disruption as logistics. While there is much hype around the future of the industry, one must pose the question: “How clearly are we seeing toward the future right in front of us?”

Through an analysis of the 3 examples above—Uber, Tesla and Amazon—I stand to argue that the timeline of actualization and the intensity of the impact of such disruptions in the trucking industry, specifically, are not as fast-approaching as would seem on the surface. Deeper looks into these leading firms reveal a much more subdued anticipation of such major foreseeable disruptions in the industry. Furthermore, key trend indicators, such as the industry’s constrained carrier capacity coupled with the exponentially growing purchases of Class 8 trucks, suggest that small and medium sized owner-operators should be looking towards the next decade as one of growth and should be positioning themselves as such.

In August 2016, Uber Technologies Inc. sent the trucking industry into frenzy when it entered the self-driving commercial vehicle market through an acquisition of Otto, a developing startup at the time. Perhaps to convey its threat of disruption to the industry, Uber used an Otto truck to self-drive 132 miles to complete “the first commercial beer delivery using autonomous driving technology” for Budweiser in October 2016. This demonstration shook the industry at an early stage and heavily foreshadowed an aggressive

timeline for Uber's automated freight carriers to be introduced on a mass scale.

However, as years have passed, Uber Freight seems to have taken an unanticipated turn. From being positioned as a dominant competitive force set to enter the freight market via automated trucks, Uber has recently "decided to stop development on [their] self-driving truck program and move forward exclusively with cars," Eric Meyhofer, Head of Uber Advanced Technologies Group, said in an email statement to Engadget. Presumably, this decision was influenced by the company's recent streamlining of a variety of its subdivisions (such as the discontinuation of UberRush) to simplify its focus and help the firm reach profitability sooner; "Uber continues to spill red ink. The company lost \$4.5 billion in 2017, up from \$2.8 billion the year before."

Uber Freight has since pivoted into a mobile application for owner-operators that "helps [owner-operators and small fleets] book loads with one tap on their smartphones and offers up-front pricing and quick payment." Such technology would serve to better aid growth in the current human-dependent market rather than disrupt it—at least in the short to medium term.

That's not to say automated trucks will not arise in the longer term. In fact, Google's Waymo, Starsky Robotics and TuSimple are just some of the many firms working towards the same technology. Tesla, having debuted its automated, battery-powered semi-truck in November 2017, is perhaps one of the most likely front runners to develop electric Class 8 trucks with auto-pilot capabilities. Yet, as with Uber, even Tesla seems to be undergoing difficulties in 'disrupting as advertised'.

Aside from the public controversy stemming from tweets of privatization, Tesla faces scrutiny on core business functions. The company has been having problems with meeting production quotas: "producing just 2,000 Model 3s a week, as opposed to the 5,000 a week [that was] promised at launch." More so, it "announced a voluntary recall of 123,000 Model S vehicles... [and then] on Tuesday April 17... [Tesla was forced to] temporarily halt production of its mid-priced, mass produced Model 3 to 'address bottlenecks' in its production line." These hardships, recalls and ongoing production issues with the Model S and Model 3 serve to challenge the viability of Tesla's ability to produce autonomous and electric commercial vehicles on a mass scale.

There is no doubt that firms like Tesla are on the cusp of being able to innovate logistics, but to be able to disrupt logistics will require these firms to be able gain mass adoption and then to be able to supply through mass production. When these bottleneck production issues finally are resolved, there is still the obstacle of garnering approval and regulation through

legislation for mass usage of disruptive on-the-road technologies such as that of Tesla or Waymo.

With the recent crashes of self-driving Uber and Tesla vehicles (operating in auto-pilot), it is foreseeable that there will be regulatory and legislative hurdles that will impede or preclude the progression towards mass adoption of driverless trucks and other vehicles. Thus, current day owner-operators should feel no angst towards having to adapt to capital-intensive disruptions such as driverless trucks in the short or medium term. However, they should be aware that such a disruption is pending in the coming decades and some reserves should be kept ready for when that time arises.

Amazon is, perhaps, the most imminent force of disruption in logistics. With a dominion over the e-commerce space, the company has set its sights on delivery and logistics technologies for a while now: from developing delivery drones, to introducing grocery on-demand services and even to the extent of enlisting its own airplanes to begin to compete with the likes of FedEx and UPS. “Brick by brick, Amazon has been building itself into a package delivery company to satisfy not only the voracious demands of Amazon shoppers but also anyone else who wanted to move merchandise from one place to another.” According to Bloomberg, in 2017, Amazon spent a staggering “\$13.2 billion on warehouses and other logistics buildup for its operations in North America... For comparison, FedEx and United Parcel Service Inc. each had more than \$5 billion in capital spending over the last year.”

Although Amazon is looking to compete heavily with industry leaders, its disruption of the logistics and, therein, the trucking industries could turn out to be a stimulus of growth that helps independent owner-operators expand their operations. Amazon has already begun utilizing sharing-economy principles to contract smaller owner-operators for Amazon loads by means of their “Amazon Flex” (geared towards individuals with cars for last mile deliveries) and “Middle Mile Providers” (geared towards trucking owner-operators) programs.

Amazon markets their “Middle Mile Providers” program specifically towards “fleet owners with a DOT# and MC# who want to provide power only to haul loads for Amazon.” Hence, the company seems to already be leveraging existing owner-operators to deliver Amazon packages. As Amazon develops its foothold into trucking, the company would actually be better served to help smaller trucking firms grow and then contract jobs with them, rather than compete with the market as a whole. In the long run, it would unsurprising to see Amazon acquire a few large fleet firms as a part of their



own logistics branch. Thus, even Amazon's disruptions in trucking so far have positive impacts on the industry for owner-operators.

This said, young logistics firms should look to grow in the coming years, while adapting to the smaller disruptions as they come. The industry seems to already be showing signs of similar trends. There are already backlogs that have occurred in Class 8 orders due to "the manifestation of all the underlying demand—the economy and the strength in freight, [as well as] the capacity crunch," ACT VP Steve Tam told Transport Topics. With the number of loads per available truck rising year-on-year, the demand for freight carriers is increasing also. Ergo, the threat of immediate disruption is low, the demand for freight is rising and owner-operators should look to leverage their resources to grow their ventures at a controlled and steady rate over the next few years to benefit from these demand-heavy industry trends. Some firms may even be able to leverage disruptive tax codes, such as Section 179, to purchase new trucks at a fully depreciated first year rate and, in turn, significantly reduce their tax expenses during periods of asset-heavy growth.

Owner-operators should be mindful, however, not to grow an at unreasonable pace. It is highly recommended to grow only when sufficient cash flow and profitability allow firms to do so. Moreover, with many financial analysts predicting an impending economic correction in the coming decade, firms should also be cautious by maintaining a healthy cash cushion during their growth—in case of economic turmoil or unforeseen disruptive forces.

As a whole, disruptions from various entrants into the industry will occur, but they will be introduced into the market at a slower rate than popular media may portray. In the short and medium run, disruptions in trucking will arise from a series of small technological adoptions of tools such as ELDs, Uber Freight's Mobile App and such. The major disruptions of the media—being auto-pilot electric trucks, for example – will be subject to a much longer cycle of adoption. As such, an analysis of the industry's immediate future reveals that firms should currently be focused on strategizing for growth in the short and medium term, while preparing to adapt to larger scale disruptions in the long run.

*Sahej Singh is strategy analyst at Reliance Partners.*



# THE COST OF CONVENIENCE

MARIA BAKER

**WE'VE ENTERED INTO AN AGE WHERE CONSUMERS** are opting to spend less time in the kitchen and restaurants, instead choosing convenience over a multitude of other factors. An analyst from UBS recently shared their prediction for the future of food: “There could be a scenario where by 2030 most meals currently cooked at home are instead ordered online and delivered from either restaurants or central kitchens. The ramifications for the food retail, food producer and restaurant industries could be material, as well as the impact on property markets, home appliances and robotics,” as quoted by Reuters.

While the restaurant and grocery industries scramble to adjust to today's trends, companies like Uber Eats, Waitr, and Door Dash can thrive in an era of customer convenience. Amazon's acquisition of Whole Foods in 2017 has even made the internet superstore a player in the grocery game—crucial in an age where consumers are opting to spend less time than ever in the kitchen. Neil Stern, a food and agriculture contributor for Forbes wrote about Amazon's previous experience with Amazon Fresh, noting that, “Whole Foods is the most credible player in fresh foods in the industry.”

“Branding an online fresh service with Whole Foods brand and perishables know-how could be a game changer,” Stern concluded.

And, with each new year comes a renewed desire to make lifestyle changes—at least for the roughly 40% of Americans who report that they made a New Year's resolution. Naysaying studies show that a whopping 80% of New Year's resolutions fail by within the first six weeks, but it still no surprise that diet and exercise are among the most common resolutions made. Topping the charts in 2018, 45% of survey respondents resolved to lose weight, while 55% of those surveyed expressed a desire to save money. But what if you could accomplish both resolutions at the same time? That's where meal-kit delivery services come in.

They cut out the meal prepping, the grocery shopping, and, in many cases, the food waste associated with cooking at home. In 2016 alone, 27% of internet users purchased a meal-kit online. Blue Apron and Hello Fresh are among the most recognizable names in the industry, and the two sites were among the top five most visited subscription box sites in the US in April 2018, according to Forbes. A study conducted by Hitwise found that Hello Fresh and Blue Apron received more than 3 million visits each in the same month.

Companies like Hello Fresh, Blue Apron, and Plated have a strong hold on the niche market, but there's room for the little guys, too. Local

meal-kit delivery businesses are popping up across the country, prioritizing seasonal produce that comes from places close to home. Despite the wide range of options when it comes to meal-kit delivery services, they all have similar aims: to make it easier for consumers to cook and eat at home. Simple, right? Not always. A single Blue Apron box could cost up to \$60,

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and according to The Washington Post, 20-30% of which comes from the price of shipping alone. For Blue Apron in particular, a shortage of distribution centers certainly factors into the cost of shipping. As of 2017, there were only three Blue Apron facilities: one in New Jersey, another in California, with a final center opened in Texas to bring down skyrocketing shipping costs to customers in the Midwest.

The Economist notes that costs don't stop at shipping, either. Blue Apron spends approximately \$85 for each new client that signs up. Grocery stores, on the other hand, "already have the footfall to minimise such costs. And because of their existing supply chains, they do not incur the same cost for ingredients as the subscription-based services."

In January 2018, Forbes published a piece on the way meal-kit delivery services are impacting the greater supply chain. According to their reporting, Plated has turned to advance machine-learning techniques to navigate supply chain and forecasting challenges, since these services tend to complicate both. It makes sense, considering that ingredients sourced from around the globe have to make it into a single box and kept at just the right temperature before it can get to your front door—and all of that can cost a pretty penny.

So what's in the future of food? At the very least, expect a continued emphasis on customer convenience, an uptick in delivery options, and hey, maybe even shorter lines at the grocery store.

*Maria Baker is a SONAR copywriter for FreightWaves.*



**ARE YOU READY FOR A \$5 HEAD  
OF LETTUCE?**

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**SUSAN FALL**



**A PERFECT STORM IS BREWING** and it's headed for an island of happy go lucky, money-spending and absolutely unsuspecting consumers. And the result is going to be \$5 for a head of lettuce. Are you ready for it because it's coming? Here's why.

The driver shortage—yes, some people say there really is no shortage and it's just a “shift” but there's a shortage. Period. And with unemployment hovering around 1% and hard-working boomers retiring, that shortage is going to get even worse.

The lack of drivers isn't a surprise to anyone in the trucking industry (driving a truck is a hard, thankless, underpaid job) but the consumer who's been spoiled by the world's most effective freight transportation system is going to be shocked when shelves aren't stocked and the price of that head of lettuce begins to rise. Oh, and the whole “I want it now, I want it delivered to my doorstep and I don't want to pay any extra for that service” mentality is going to have to change. Either be willing to pay the extra money to have it delivered to you or go pick it up yourself.

The point is that someone's got to pay for that delivery and the trucking industry isn't going to absorb that cost, too! When manufacturers turned trucks into rolling warehouses and called it Just In Time delivery, thanks to GPS and onboard computers it was doable, but when grocery stores wanted the same treatment it got a bit tougher and definitely more expensive (most trucking companies now have 3 trailers to every tractor and the ratio among food haulers is even higher). Now the consumer wants to have that level of service and not pay for it? Good luck!

The economy—it's good right now. People are spending, houses are being built and commercial properties are transforming. Life is good. But as we all know, what goes up must eventually come down. This time, though, when it comes down we are going to have a whole bunch of college-educated labor, an entire generation of people with \$200,000 in student loans who no longer know how to check the air in their tires or bake a pie because we've removed just about every skilled trade from our education system. No more auto or wood shop, home economics, etc. Those classes were staples that taught real world skills. Today, they've been mostly replaced by classes in technology skills.

So what we have is a society, aged about 40 years and younger, that happily clicks and pays for “labor” to be done for them. Deliver a meal in a box to my house? Beautiful. Look on my phone to find the nearest plumber that will be at my house in 30 minutes? Excellent. Pick me up, drop me off, and why bother drive when someone else can do it for me? Oh and will you

walk my dog for me, too? The reason why unemployment is at an all time low is because enough people are making enough money to be lazy. But what will happen when that head of lettuce is \$5? I think people might start walking their own dogs again, that's what!

Technology—I believe the last figure I saw was \$80 billion tied up in transportation and logistics technology products. \$80 Billion! It's not like the logistics and transportation industries just suddenly appeared. They've been keeping our country moving since wagon trains first crossed the continent. What's happened is it's an industry that was suddenly noticed by investors, engineers and young entrepreneurs. It's been 20 years since the mobile revolution. We've got new blood that wants to figure out the next big thing and the industry of choice is transportation. "What can we do to fix this whole logistics system and make millions while we're at it" (or should I say "billions" considering 80 of them are already invested in it!)?

I'll be the first to admit that our logistics and supply chain industries could absolutely use some help from technology (it's a bit like the trucking industry before the introduction of onboard computers) but I'm not so sure it's \$80 billion dollars broken. There are a lot of "cool" technologies out there that will add visibility and transparency and make sure the grapes in that \$200 bottle of wine really came from where the bottle states. But will those technologies keep us from paying \$5 for a head of lettuce because we no longer have people willing to drive trucks? I think not.

Well actually, now that driverless vehicles (especially trucks) aren't going to be a reality by 2020 as the over-hyped media was reporting, a lot of attention has shifted from transportation to logistics. The irony in all of this is that driverless trucks probably could be the one thing that could keep us from paying \$5 for a head of lettuce (but that's just not going to happen in time).

So here we are with a perfect storm heading our way and what are we going to do about it? Investors are going to want their money back (and to make some) but someone has to pay for the technology that is going to fix the "broken" supply chain. That someone will eventually be the consumer and when lettuce becomes \$5 a head that whole fast moving overloaded supply chain is going to come to a screeching halt.

*Susan Fall is president of LaunchIt Public Relations.*



# **TECHNOLOGY AND THE FUTURE OF FREIGHT BROKERAGE**

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**FELIPE CAPELLA**



**THINGS ARE CHANGING A LOT** in the freight brokerage industry. Technology startups have flocked to tackle big and small problems in the supply chain. Venture capital funds are backing different solutions excited about the size of the market.

And yet, despite the fanfare, there are complaints that technology so far hasn't been able to truly address the current truck capacity problem, which has tightened to historical levels due to regulation, shortage of drivers and historical inefficiencies.

This is in large part because the industry's complexity and historical aversion to change have lengthened the adoption cycle of new technologies among traditional shippers.

Nonetheless, the latest digital products are already playing a fundamental role in shaping the future of the trucking and freight brokerage industry. And what's coming next is really exciting.

Soon, brokers won't need thousands of employees to power their operations; instead, new technologies like machine learning and artificial intelligence, ubiquitous data sharing, more secure and available chain of ownership (e.g. via blockchain technology) and real-time, over-the-air telematics will serve as potent force multipliers. All of this will dramatically reduce the actual cost of brokering freight and increase consolidation of small-and-medium-sized brokers.

In the long run, things will change more dramatically. Several states will clear autonomous trucks for specific lanes (hub-to-hub). Carrier operational costs will drop significantly, and drivers may move from carrier-based to warehouse-based. Huge consolidation on the carrier side will follow. Small companies will likely struggle to compete in this new environment, displaced, swallowed up, or put out of business by large enterprises with massive fleets of semi-autonomous or fully-autonomous vehicles, where few carriers will be moving a very large portion of the total FTL shipments. The exact role original equipment manufacturers (OEMs) will play in creating this new trucking reality is, for the moment, less clear, but it will likely be important as they too want to become software and service providers. Some big enterprises shippers will end up running their own autonomous truck fleets, but most companies will rely on third-party autonomous truck providers.

## **BUT WHAT TECHNOLOGY CAN HAVE AN IMPACT RIGHT NOW?**

The number one bottleneck of shippers is locking up reliable capacity. Therefore, any new product that does that without adding complexity adds a lot of value.

Loadsmart was the first to launch truckload instant pricing/booking in the US (2015); first to launch One-Click load acceptance app for carriers (2015); first to launch instant pricing API for TMS integrations (2016) and experienced the first fully automated quote-book-source flow in the truckload spot market (2016).

We have now integrated with several Fortune500 shippers to provide a pre-spot solution by fully automating quoting and booking of truckload shipments. By doing this, we make it possible for companies to automatically book a truck before the shipment turns into a spot load, accepting 100% of those tenders and guaranteeing capacity. This helps shippers avoid the same-day/next-day markets, which are known for steep prices and service failures. Here is how it works.

### *(a) Semi-Automated Dynamic Routing Guide*

We integrate with the Shipper's transportation management system (TMS) via API to access data about all shipments that need to be moved. Loadsmart runs each shipment through our machine learning pricing algorithm and returns a live, bookable rate directly to the Shipper's TMS.

This allows the shipper to compare the prices from other carriers and brokers, which are logged in their static rate tree, with Loadsmart's instantly bookable rate. Because it is given real-time, the rate is always live and can be booked with one click. No emails; no phone calls.

That means that when the primary carrier fails, the load planner can execute the shipment right away. Not only does this provide price protection at above-standard service levels, it also creates internal efficiencies for the shipper by saving time for the planners. It goes without saying that this also allows Loadsmart to operate much more efficiently, generating further savings that can be passed along to the customer.

### *(b) Fully Automated Dynamic Routing Guide*

In a fully-automated flow, instead of the shipper's load planner manually comparing our pre-spot dynamic prices with static rates from their routing guide, this is done automatically on a server.

There are two steps to the automated process of price discovery and comparison. First, an algorithm evaluates the acceptance rates of carriers and brokers whose static rates are in the route guide. If they have rarely or never agreed to move the load at their routing guide (or annual bid) rate, then the algorithm skips them to save time.

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Second, the algorithm requests a real-time rate from the Loadsmart pricing API. It then moves down the routing guide from least expensive to most expensive rate, contacting only carriers who the shipper has reason to believe will respond. It keeps doing this until the next lowest rate is Loadsmart's instantly bookable rate. At that point, the algorithm automatically tenders the load to Loadsmart via API.

This allows for a full automation experience that in practice reduces the time to identify and secure truckload capacity by as much as several days, increasing on-time delivery and decreasing cost of hire. Further efficiencies accrue to the shipper as either very limited or indeed no manual work is necessary, decreasing errors and human capital costs while optimizing decisions.

#### **WHAT ARE THE UPCOMING TECH TRENDS?**

Earlier this year, we predicted that these four technology trends will have a big impact in the freight brokerage industry in the short term: Data Sharing and Open Access

Logistics industry players have traditionally been very protective of their data. Freight brokers are the epitome of this trend, siloing all information and creating close environments for software use. In 2018 we will see more openness, with many companies in different businesses sharing data for mutual benefit. While initially this initiative will be to better understand market dynamics, it will provide a more efficient service to end clients in the long run. Software will also become more open to utilization across different platforms and fear of IP replication will give space to the distribution benefits of openness.

### **APIS REPLACE EDIS**

EDIs have to die. Information is exchanged between computers asynchronously—think fax machine: as a specific event, not on an ongoing basis. This delay causes multiple operational challenges, increasing the chance of missed status changes and precluding the automation of manual-intensive processes such as calls and emails. Companies that want to embrace automation and integration with tech partners have to build proper APIs that are easy to use and easy to maintain.

### **INSTANT PRICING/BOOKING**

Instant and on-demand features will start claiming a bigger portion of the industry. Traditional shippers are starting to move towards a more connected and immediate electronic and digitized response to their spot and contracted business needs. Speed, reliability and just-in-time are needs that modern shippers have, which will make instant truck booking an essential technology.

### **DEEP NEURAL NETWORKS: BEYOND PRICING AND SOURCING**

Loadsmart relies on machine learning processes and complex algorithms to allow instantly booking of a truck and to identify the best truck positioned to move each load after the booking the shipment. As more data becomes available and volume increases, deep neural networks will claim a bigger part of the success on the right pricing and sourcing computational-processes. But more importantly, these neuron-mimicking flows will also change repetitive human responsibilities to computer generated tasks (without the need for task-specific programming). Identifying potential issues before they actually happen – or are known – will be of great value in the logistics industry.

*Felipe Capella is co-founder and chief product officer at Loadsmart.*



# **DIGITAL 3PLS PAVING THE WAY**

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**ALEX RYU**



**THE US 3PL INDUSTRY IS GROWING** very quickly. It has a market size of \$160 billion and has shown a promising 7.5% YoY growth. A whopping 96% of Fortune 100 companies are using 3PL services. When the US economy growth has been between 2-4%, where has this huge growth on the logistics services side come from? My observation is that customer-facing industries have increasingly outsourced their logistics service needs to 3PLs in order to survive global competition where higher productivity and speed is required to remain competitive. The e-commerce boom is a growing part of the world economy which makes outsourcing is inevitable for current 3PLs. To remain competitive, 3PLs will need to focus on functions that add value and increase supply-chain productivity. Beyond that, intermediaries need to exceed expectations, and expand their offerings into areas such as forecasting, supply chain design, purchase and cost management to truly compete.

As the pressures of customer support increases, seemingly the 3PL industry is experiencing growing pain. Customers of today demand higher levels of transparency, real time visibility, omnichannel fulfillment, information integration, accelerated delivery cycles and last mile technologies. The traditional 3PL industry, unfortunately, is unable to cope with the changes due to their old fashioned and inefficient processes, thereby causing significant industry frictions that we are seeing today. Traditionally, the industry revolved around providing shippers with a

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CUSTOMERS OF  
TODAY DEMAND  
HIGHER LEVELS OF  
TRANSPARENCY,  
REAL-TIME  
VISIBILITY,...  
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reliable service, and you could argue that the way of doing business, was somewhat stable. Today, manual processing, fragmented IT infrastructure and a lack of integration capabilities create discord. Many 3PLs seem to have not surpassed this level.

On the contrary, market leaders are investing multi-millions of dollars in employing technological advances that digitize and transform the logistical experiences to survive the changes. They are able to achieve productivity goals and reduce labor costs. Some are able to form M&As and take advantage of synergies and are able to

scale. This, however, is a dream for many 3PLs who currently operate with low margins and high competition - essentially blocking them from achieving economies of scale in their businesses. The goal of service customer industries mandates a focus on generating core business value, and efficient operations. The inability to keep up with the growth in

demand, pressures for change, high competition, and fragmentation are all driving industry polarization.

How do we outsmart this change? How can we help customer industry better? Opus9 exists for this very reason. The industry has suffered from a lack of transparency in the market. Specifically, customers don't get fair quotes or accessible pricing to determine what is correct. Disputes and delays are riddled in this industry and old-school practices limits efficiency in this billion-dollar industry.

Opus9 is trying to ease the life of customers and carriers nationwide, and are trying to bring transparency to the market through technology. Transparency in pricing, cost, visibility and payments are our priorities. By leveraging current generation of technologies, we reduce operating costs by 50% and are able to share the savings with customer and carriers. Rooted in traditional third-party logistics, we developed a digital marketplace—a digital brokerage platform focused on optimizing domestic shipping. The platform focuses on truckload (dry van, refrigerated and flatbed trucking) and less-than-truckload shipping. It connects customers and carriers more efficiently. Via our platform, customers can get a competitive quote in seconds for truckload and less-than-truckload shipping, book easily, and track their shipments in real-time. Using our platform, shipping effort is significantly reduced. These efficiencies enable customers to meet the growing expectations of their customers. We also offer a carrier-centric approach to shipping, where a closely-knit network of trusted carriers are given the tools to create better working conditions.

The ultimate goal is to streamline the shipping experience by providing an intuitive platform, which is easy and straightforward to use, and has a user-friendly design.

Global consumers are calling for enormous changes to the customer industries. Be it retail, manufacturing, electronic or the food industry—they are also aggressively seeking, chasing and embracing the changes brought to them by new era of technologies. The only way to stay ahead of them and to serve them is by being digital.

*Alex Ryu is founder and CEO of Opus9.*

An abstract graphic design featuring a series of overlapping, semi-transparent gray rectangles of various heights and widths, arranged in a roughly vertical column. A solid black horizontal line crosses the middle of the composition, passing behind the text.

# **DATA-DRIVEN CONTROL OF DISTRIBUTED RECONFIGURABLE SUPPLY CHAINS**

**CHIP WHITE**



**VARIABLE AND CHANGING GEOGRAPHICAL** customer demand has usually been met by transshipment, expanding or contracting production capacity at existing facilities, and either eliminating old or adding new facilities. The increasing interest in additive manufacturing and other forms of (potentially) mobile production capacity offers an additional dimension for improving the performance of next generation supply chain design and operations, especially by reducing fulfillment time with build-to-order product design and highly distributed manufacturing capacity close to geographically dispersed areas of demand, according to S.S. Malladi's dissertation research.

An interesting challenge for industry is to determine excellent transshipment, mobile production capacity relocation, and/or replenishment decision strategies. To do so requires the ability (and investment) to analyze demand data and other data correlated with demand (e.g., seasonal effects, macro-economic conditions, weather, time of the day, day of the week) in order to more accurately identify customer demand trends on which to base good decision-making. An alternative approach is to invest in product design to shorten lead times so that the product can be differentiated late in the production cycle close to the customer, thereby reducing the need for accurate demand forecasts and enhancing time to fulfillment.

Major players in the pharmaceutical industry are developing manufacturing innovations, such as transportable production facilities for synthesis of pharmaceutical outputs. Bayer demonstrated the production of fertilizer intermediates in a twenty-foot-equivalent-sized container. Pfizer is in collaboration with GlaxoSmithKline to commercialize portable, miniature, and modular manufacturing technology for drug production. Novartis has developed a refrigerator-sized, on-demand pharmacy unit for fast tablet production. E-commerce giant Amazon won a patent for the logistics of mobile, additive manufacturing based fabrication and fulfillment. These developments signal a future where transportability of production facilities is an added dimension for supply chain design and operations.

*Chelsea "Chip" White III is a professor at the Stewart School of Industrial and Systems Engineering at Georgia Tech.*



# **TECHNOLOGY ALONE WILL NOT SAVE THE INDEPENDENT BROKER**

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**BRUCE MCGONIGAL**

**COURAGEOUS INDEPENDENTS SHARING EXPERIENCE**, ideas and data on an open decentralized platform could allow independents to thrive. Yes, technology including machine learning, A.I., smart contracts, distributive ledgers, automation, etc are critical. But these are simply tools.

model. If we do not change our model we will cede our future to the new mega-broker. Think Google in search and Facebook in social media. That is our future if we do not act. We operate in silos of talent, ideas and data. We must be willing to break down our silos to share our knowledge, information and experience. This will allow us to compete and thrive in the new digital era.

If you own a small to medium size freight brokerage, your livelihood is under attack. The “Ubers of transportation (including Uber)” are coming after your businesses. Money, tech and talent are invading our industry. Their goal is to dis-intermediate and “digitize” what we have been doing with phone calls, emails and good old fashion relationship building.

I have heard the counter-argument, “Freight is different. Some freight may be lost but my freight requires special knowledge that apps can’t provide. Hell, I am having the best year I have had in years!” This is dangerous thinking.

Disruption in the freight industry is happening. We can be forgiven for our skepticism. Disruption is deceptive. It all starts with hype. Remember all of the headlines about the “Uber’s of Transportation” disrupting the market? But then, reality sets in. Disruption is not easy. Many first movers featured in those headlines no longer exist. At this point, the “I told you this would never work with freight” mantra gets louder. This is dangerous thinking because real change is happening, below the radar.

This change is true disruption. It seems to come out of nowhere because many stopped paying attention. After all, business is good. But, disruption is happening and the impact of the technology and data control will be devastating. We are iwell into this deceptive phase of disruption. We must wake up if we want to participate. Freight is NOT different.

If we do not act, we will die a “death of a1000 cuts.” Smart money, smart technology and smart people are laser focused on dis-intermediating our businesses. They see in us an old fragmented industry poised to be disrupted. They draw parallels to other industries, like financials services, which were once dominated by fragmented intermediaries. The disruptors see the roadmap and have a plan. But the future of business is not predetermined. We have a say in this outcome. But we must adapt not

only our technologies but radically change our business model if we are to thrive.

### **HOW DO WE THRIVE IN THIS NEW WORLD?**

Dare I say thrive? Yes, Independent brokers with an innovative model that breaks down individual silos and unites us on an open broker platform will give us the scale to compete. We maintain what makes us valuable- our independence, creativity and our entrepreneurial spirit. Skin-in-the-game is our edge. But, we must be willing to share everything we now consider proprietary. Our data, our shippers, our carriers, our knowledge. All of it. And for this willingness to share, we must be compensated for the value we bring to the platform. We must replace fear of competition with the power of collaboration.

A network of independent brokerages connected through a decentralized open broker platform will empower us to service our shippers and carriers at the highest levels. Connecting through a platform allows us to use our collective data, skills and knowledge to power us into this new business environment where everyone and everything is connected. Alone, we do not have the data, money or technology to compete. Together, connected through an the open broker platform we can do great things. And, maybe even out-compete the mega-brokers in their mega “silos”.

Why decentralization? We avoid the pitfalls of group think. An open platform allows us to create and design services that meet the specific needs of our partners. We will design as many relevant solutions and applications that we can dream up and implement. Centralizing partner relationships limits creativity and service. Centralized solutions provided by mega-brokers will primarily benefit the mega-broker. Mega-brokers controlling all data, will put all parties in the supply chain at their mercy. This should be a frightening scenario to shippers or carriers..

Why shared data? One of the biggest challenges to succeeding as an independent broker is limited data points. We operate in silos. Our information is limited. independents touch too few points in the supply chain. This is the mega-brokers’ competitive advantage. Independent brokers must share data to close this information gap. But, we will only close this gap if independents are compensated for opening up their silos.

What will an independent provide that is unique and valuable? A few examples of value add opportunities are when your data match a carrier and shipment and visa-versa; it is valuable when your data provide the accepted rate in a RFP; it is valuable when your knowledge provides the solution to

a partner's problem. Sharing data (lanes, rates, opportunities, history, etc) via an open broker platform empowers all parties on the platform. We must share and we share because we will be compensated.

How do we get compensated? Trust through smart contracts and the blockchain. Immutable, verifiable information and pre-established rules allow independent parties to transact without the need for a centralized entity. Before this breakthrough technology trust was only possible with a centralized party clearing and processing transactions. Think of big banks and credit card companies. A transportation example is the corporate office

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**DISRUPTION IN  
THE FREIGHT  
INDUSTRY IS  
HAPPENING.**  
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of an agent based freight brokerage. The agent model only works because the corporate office is a trusted centralized clearing house to process transactions.

The blockchain removes the need for a centralized party thus freeing up independent companies to work together without one party holding all of the control. Smart contracts are agreements between parties that are stored and executed on the blockchain. These contracts are verifiable, immutable and permanent. Smart contracts cover all types of agreements including payments between parties. These contracts are automatically executed when per-determined parameters are met. We no longer need a centralized clearinghouse. The blockchain along with smart contracts allows trust to be established between independent parties. It allows independent brokers to reimagine and transform their businesses.

**PLAY ALONG WITH THIS SIMPLISTIC SCENARIO...**

- A load is moved through the open broker platform. These are the predetermined rules.
- When load is delivered and a verifiable POD is received then:
- Broker A's Shipper / Freight / Data = 55% of gross profit.
- Broker B's Carrier/ Dispatcher / Data = 35% of gross profit.
- Administration = 10% of gross profit.

**HERE'S A SCENARIO:**

- Load pays \$1000. Carrier pay \$800. Gross profit is \$200.
- When the load is delivered, the bills are clean and a POD is received the smart contract triggers the following payments automatically.
- Shipper is invoiced/ pays \$1000

- Broker A gets \$110
- Broker B get \$70
- Administration gets \$20
- Carrier gets \$800
- Eventually, carrier pay could be broken out and the driver could get immediate settlement-based on his contract with the carrier.

No entity has to follow up, verify payment or track down another party for compensation. Trust through the blockchain allows independent parties to work together, share information and be promptly and fairly compensated for their contribution to the process. This disruptive technology does not have to be the death of the independent broker. It can be its savior. But the independent broker must rethink its business model. We must be willing to tear down our silos and work together.

Our future is not predetermined. We have a clear choice. We can chose a centralized group-think future dominated by mega-brokers. Or entrepreneurs with skin in the game creating unique solutions for their shippers and carriers powered by a shared vision, shared talent and shared data.

Operating in a silo is the fastest path to failure. Overcoming traditional barriers to collaboration utilizing this breakthrough technology presents independent brokers the opportunity to thrive.

The choice is clear and the choice is ours. The only question is do we have the courage to act.

Together we stand, divided we fall.

*Bruce McGonigal is CEO of Eagle Transportation Logistics.*

**BROKERS AND THE  
MARKET CAN AND  
WILL BECOME  
MORE EFFICIENT  
BECAUSE  
THAT IS WHAT  
TECHNOLOGY  
DOES.**

**GREG CALLIGARI**

SECTION FOUR

**CAPACITY  
ECONOMICS**

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04





# **HOW DOES IT ALL END? RESOLVING THE CAPACITY CRUNCH**

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**IBRAHIIM BAYAAN**

**PERHAPS THE CENTRAL THEME IN TRUCKING** and freight markets over the past year has been the persistent capacity crunch in the industry and the effect that it is having on freight rates and overall performance. The discussion has pushed past industry circles and has made its way into mainstream press, with analysts across the spectrum trying to identify what caused this trucking shortage and, more importantly, when will it all end.

Often, people seem to be searching for some magic bullet or shock to the industry that will resolve the current capacity issues. But basic economic principles say that a shortage is simply a situation where the amount supplied is less than amount demanded of any particular thing. Shortages typically don't last forever, as prices, supply, and demand adjust to bring everything back into balance. To better understand how the capacity crunch finally ends, it is worth taking a look at the various factors that are likely to change to bring the market to a new equilibrium.

#### **THE BUSINESS CYCLE**

Perhaps the most commonly cited “solution” to the current capacity crunch is a change in the overall macroeconomy. The US economy has been on a tear in general since the 2nd quarter of 2017, with GDP growth averaging nearly 3% during that time span. The Tax Cut and Jobs Act, which went into effect at the start of 2018, has helped boost growth even further in 2018 by giving additional incentives for US households and businesses to spend.

The goods side of the economy has been even stronger, with healthy growth coming in retail spending, mining and drilling activity, business investment, and goods trade. With the exception of some lingering softness in housing and construction, the goods economy is hitting on all cylinders. The robust expansion of goods production has been one of the driving forces behind the current capacity constraints, exposing the shortage of trucks and drivers that are available to move all of the freight that a rapidly-growing economy demands.

It seems natural to assume, then, that a turn in the business cycle will remove the capacity crunch. If the demand growth in the economy is not there, the industry may soon find itself with more drivers and capacity than it knows what to do with. Indeed, the last time the trucking industry was faced with tight capacity and comments over a shortage of drivers was in 2014 when industrial production grew at one of the fastest paces in the post-recession era. Industrial output declined in 2015 and 2016 as low oil prices and a relatively high value of the US Dollar sapped much of the demand

for domestic production. As the economy turned sour, most of the talk of capacity issues in trucking went with it.

The current economic expansion is now getting long in the tooth. The economy has been growing steadily for over nine years now, making it the second-longest expansion on record. The economy overall seems ripe for some kind of turn in the business cycle, and a recession would lead to excess capacity in trucking.

However, a turn in the business cycle is just a temporary fix. The economy will always experience ups and downs in the different sectors of activity, but that does not provide a long-term solution to capacity issues. The reality is that the trucking industry faces significant challenges regarding an aging core of drivers and difficulty recruiting and retaining drivers. These challenges go beyond the fluctuations in the macroeconomy and suggest that there need to be some fundamental changes to either the amount of freight that shippers demand or the way that carriers expand capacity in the market. Otherwise, capacity constraints will come and go as the economy shifts from healthy to unhealthy.

#### **IMPROVEMENTS IN HIRING AND RETAINING WORKERS**

On the capacity side, it seems clear that the industry needs to take steps to better attract and retain workers to trucking. More drivers equal more capacity and if carriers can bring drivers in and keep them, trucking can better keep up with the growth of freight demand in a healthy economy.

The real question is what kind of things can be done to better bring drivers into the industry and away from other kinds of work. Wages are part of the answer, as higher pay will make truck driving more attractive relative to some other industries such as construction which require similar levels of education and training.

However, carriers have been fairly reluctant to raise wages for drivers. Part of the reason for this is fear over a downturn in the industry. The goods side of the economy is more volatile than the service side, and what is a strong freight demand environment today can turn quickly into a freight recession. Many carriers learned during the Great Recession and the down years of 2015 and 2016 that it is hard to reduce wages once they have been increased, and have been reluctant to provide a permanent increase in worker pay.

Instead, carriers have opted for temporary incentives such as signing bonuses to lure workers into the industry.

In addition, it's not entirely clear that offering higher pay will lead to more work from drivers. Over-the-road trucking is a difficult career from

a lifestyle perspective, often requiring extended periods of time away from home. Even among driving professions, other types of drivers such as local truckers or parcel deliverers enjoy considerably more time at home than their over-the-road cousins. Many drivers might take the higher pay and instead opt to work fewer hours on the road, negating some of the impact on capacity in the market.

As a result, recruitment and retention efforts would do well to address some of the work-life balance issues facing the industry. Also, screening efforts to better target the kind of people that would fit the lifestyle of an over-the-road trucker would likely be fruitful, streamlining the recruitment process and helping with long-term retention in the industry. A combination of pay and types of efforts will better add capacity to the market instead of simply raising wages until drivers sign up.

### **LEVERAGING DATA TO MAKE DRIVERS MORE EFFICIENT**

At the end of last year, the government began the process of requiring electronic logging devices (ELD) on trucks to better enforce hours-of-service regulations, culminating with the April 1st hard mandate. Many point to the ELD mandate as one of the causes of the current capacity crunch, reducing the amount of hours that drivers spend on the road as they can no longer take liberties with paper logs.

However, electronic devices also provide the opportunity to collect data on shipper and driver behavior, and can help identify ways for drivers to use their time more efficiently. Hours of service regulation place limits on the amount of time that a driver can spend driving and on duty. However, drivers on average spend far less than the time allotted actually driving, wasting precious time on things like waiting for shippers to load and unload cargo from the dock to the truck.

ELDs provide a hidden opportunity in this regard, as carriers will have to opportunity to leverage the data that is collected to identify bottleneck in freight movements. The data that gets collected can be used to facilitate discussions between shippers and carriers to maximize the amount of time that a driver has at his/her disposal.

Beyond ELDs, there are other ways that companies can leverage analytics and data to make fleets and drivers more efficient overall. Improved analytics have already yielded new techniques to match empty truck to available loads, and additional gains in understanding granular regional freight demand will help to make sure that the limited capacity that is available is in the right place to meet available freight.

All of these gains help to expand capacity in the market overall. If the number of drivers is going to continue to grow slowly, then the industry will have to maximize the workforce in order to fulfill all of the demand in the economy.

### **AUTOMATION AND CAPACITY**

Connected to this, continued developments in autonomous technology should gradually help ease capacity constraints. Companies such as Waymo and Starsky have already taken some significant strides in automation earlier this year, and the current capacity constraints have led to increased attention on developing these types of innovation. The development of autonomous vehicle would not eliminate the need for drivers, as carriers will still need people to oversee things like loading and unloading. Still, if machines are doing the driving it stands to reason that hours-of-service regulations can be relaxed. This would extend the amount of time that drivers can spend on the road, effectively bringing capacity back into the market.

However, the development of fully autonomous freight movements is still likely a ways away. Navigating through technological and regulatory barriers can be challenging, and the world where autonomous or semi-autonomous vehicles relieve a significant amount of pressure from freight market capacity is likely still years away.

### **REEVALUATING TRUCKING FREIGHT DEMAND**

Up until now, much of the discussion here has focused on ways that the industry can find ways to increase the amount of trucking capacity in the market to meet the available demand in an economy that is growing at a respectable pace. But the trucking shortage will also affect the amount of trucking freight that shippers demand going forward. Along with the challenges of finding available carriers and tightness in trucking capacity come higher rates that shippers have to pay for trucking freight and increased shipping delays.

Moreover, businesses in the economy still find themselves in a situation where they cannot pass on these increased freight costs to the end consumer. This reality hit many shippers hard during the early part of the year, as earnings calls from the 1st quarter were fraught with companies having to eat their increased transportation spend and suffering hits to profit margins.

As a result, many shippers have begun to reevaluate their transportation needs. This involves everything from rethinking the amount of inventory (and inventory turnover) businesses need to hold, to determining the appropriate mode of freight to use for the goods that need to be transported. As trucking

has gotten more expensive, and shipping delays have increased, trucking freight has become less attractive relative to traditionally slower and cheaper modes such as rail or intermodal.

Much of this is already underway, as both rail and intermodal carriers have experienced rapid growth in volume throughout 2018. The effects of the trucking shortage have spilled over into these other modes, and forced carriers in these arenas to expand their own capacity to address the influx. Clearly, not everything can be moved via rail or intermodal in the economy and trucking is still going to be the dominant force within land-based freight movements. Still, as trucking capacity remains tight, expect more of these kinds of mode shifts as shippers rethink their freight needs and high trucking prices squeeze margins.

### **PUSHING TO A NEW EQUILIBRIUM WITHIN TRUCKING**

Over time, a combination of all of the above efforts will help the market find a new equilibrium. Carriers in the industry will continue to increase pay and find ways to make a driver's lifestyle more bearable. At the same time, advances in technology and data analytics will increasingly be used to find more effective ways to maximize the available capacity in the industry to better meet demand. On the demand side, as trucking gets more expensive, shippers will find ways to mitigate transportation costs, either by reducing the amount of freight movements they actually need, or considering other modes for some of the transportation that has to occur. And in the end, trucking will find itself in a new equilibrium where drivers enjoy better pay, freight is more expensive to move, technology is more prevalent, and other modes of transportation play a greater role.

Of course, all of this can change quickly if the economy turns south. One of the side benefits of having an economy that is running as hot as it is, has been that it has exposed many of the long standing challenges within trucking. Trucking and the availability of freight has become one of the potential bottlenecks in the economy, and has received some long overdue attention as a result. If the economy enter into a period of recession or a dramatic slowdown, many of these long-term structural challenges facing the industry are likely to be swept back under the rug instead of solved. Out of sight and out of mind until the next period of strong growth brings it back into the light.

*Ibrahiim Bayaan is chief economics officer of FreightWaves.*



# **HOURS OF SERVICE: WHAT'S NEXT?**

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**DEAN CROKE**

**TO UNDERSTAND THE CURRENT SITUATION,** we need to look back in time so see how we got here.

### **HISTORICAL PERSPECTIVE**

The hours-of-service (HoS) were first promulgated in 1936 by the Interstate Commerce Commission and remained unchanged for 68 years until 2004 when the first major rule change was introduced. Up until 2004 truckers could legally drive for ten hours each day, but only needed to take eight hours off with a 15 hour daily clock limit. For many drivers this meant a new workday started every 18 hours and in the sleep science and fatigue management world, this is the most dangerous. It's known as a backward rotating 6-hour schedule, which means sleep starts 6 hours earlier every 24 hours. It's the equivalent of flying to Paris from Boston and trying to fall asleep immediately upon arrival – it's impossible and creates a never-ending feeling of jetlag. For truckers it was a disaster, as they would never sleep at the same time each day.

The rapid flip-flopping of a driver's weekly work schedule meant if a they started work at 6am on a Monday, the next 10-hour shift would start at midnight, the next at 6pm, the next day at midday the following day and so on. Imagine trying to go to bed six hours earlier every day of the week – it's impossible and why these schedules create what's known as "Industrial Jetlag."

From a physiology perspective, most humans are designed to go to bed later (which explains why we all stay up a little later on weekends) which makes a forward rotating schedule more bio-compatible i.e. work starts later each day, and that's why the FMCSA began adopting many of the best practices developed around the world, including Australia's groundbreaking Fatigue Management Program – the world's first performance-based hours of service program. What we still lack to this day, is quantitative data that compares fatigue related accident frequency and severity over time. This lack of data is compounded by accidents being recorded in databases by the description of what happened (run off road, hit guardrail, rollover, sideswipe, rear-end) rather than cause (microsleep).

### **THE 2004 HOS RULE CHANGE**

As you read this remember that the main purpose of the Hours of Service (HoS) regulation is to keep tired drivers off the road and prevent accidents caused by fatigue. The reality is that a driver can be 100% compliant with HoS regulations and be sound asleep at the wheel at the



same time. This is why the current fixation on reduced HoS violations due to Electronic Logging Device (ELD) implementation is so misleading, as there is no observable correlation between compliance to unsafe regulations and reduced levels of accident severity.

The logic behind the 2004 rule change is centered on how humans have evolved to sleep. We all have an inbuilt drive for anchor sleep i.e. sleep at the same time and in the same place every day, so creating a daily schedule that is more aligned to the human sleep-wake cycle was paramount. This sleep-wake cycle is on a 24 hour oscillation, which is why we are designed to wake with the sun and go to bed when the sun goes down. If you follow the math behind the HoS rule change you'll quickly see why the rules changed; 11 hours on-duty, plus three hours on-duty/non-driving, followed by 10 hours off duty adds to 24 hours, which aligns with our hard-wired sleep-wake circadian rhythm (and the rotation of Earth around the sun).

The theory was that since the sun rises every 24 hours and the invisible light spectrums' blue light wavelength at 450nm (this is why you have a Night Shift feature on your iPhone to shut off blue light) that triggers the body clock to start the daily wake-sleep cycle (plus 100's of other circadian rhythms), a 24-hour workday would solve all of our problems or at least get us headed down the right road.

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MANAGING AND  
REGULATING SLEEP  
WOULD A FAR  
MORE EFFECTIVE  
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—

The problem was and still is, sunlight, and unless you can control the precise timing of blue light to the optic nerve, which is the sleep/wake cycle's primary cue, you can never really switch from being a night sleeper to a day sleeper. If every 10-hour break started before sunrise, drivers would be much better off, but since most drivers have varying start times with 10-hour breaks or off-duty periods often occurring during the day and after sunrise, sleep quality and quantity is often diminished. Research shows night shift workers globally get 2.5 hours less sleep compared to dayshift workers when sleep occurs after sunrise, but also suffer from poorer sleep quality and

health. For truckers, FMCSA research shows truckers on 10-hour breaks that occur after sunrise get on average 4.5 hours of sleep per 10-hour block.

Add in burdensome and prescriptive rules such as the 14 hour rule (where driving can no longer occur after 14 hours has elapsed from the time you went on-duty), and we end up with compliant, but unsafe driving

scenarios. Since a nap or rest-break does not stop the 14 hour clock, drivers have to decide whether they want to run miles and make money, or stop for a nap and burn up hours for zero financial gain.

### **WHAT'S NEXT?**

It's not all doom and gloom despite the inherent flaws in the current HoS regulation. There is a positive side to this situation since the data that now comes from ELD devices provides a level of previously unattainable insight.

In addition to regulatory exemptions to parts of the HoS regulation (such as allowing naps to stop the 14 hour clock), there are at least five areas motor carriers can immediately begin working on to mitigate accident risk:

1. Sleep Education
2. Bio-compatible Scheduling
3. Data Analytics
4. Shipper of Choice Programs
5. Truck Ergonomics

### **SLEEP EDUCATION**

Sleep isn't something we're taught in school, yet it is vital to our survival and since everyone is born with a different and unique biological clock, there's never a one-size-fits-all regulatory solution, no matter what the industry. This isn't about Fatigue Management as that's what you get when sleep is truncated, disrupted and shortened. Drivers know what fatigue feels like, and yet still struggle to get good quality sleep. Teaching drivers, their spouses and teenagers along with middle management is vital to engineering in physiology-based safety into transport operations. The Federal Motor

Carrier Safety Administration (FMCSA) and most industry participants for that matter, have this misguided notion that if we manage hours of work through regulation, we can magically ensure drivers have sufficient time to be well-rested and fit-for-duty for the subsequent shift. The problem with that logic is unless you teach drivers how to rest and / or sleep and most importantly manage the factors contributing to sleep (like temperature, time of day, light, self-medications and sleep disorders), there is little chance the driver will get the required quality of sleep. Managing and regulating sleep would a far more effective strategy if improved road safety was truly the goal.

## **BIOCOMPATIBLE SCHEDULES**

Once middle management and drivers are taught the science of sleep, including an understanding of their own hard-wired sleep personality (morning lark, night owl etc.), load planners and driver managers can begin to design trips and load appointment times around the drivers' preferred work and rest patterns. It's called bio-compatible scheduling which doesn't mean doing less work or miles, rather they are done in such a way as to ensure the highest levels of productivity and safety. Studies show well-rested drivers typically run 10% more miles per tractor week and have 60% fewer severe accidents.

## **DATA ANALYTICS SOLUTIONS**

Electronic Logging Device (ELD) data is a rich source of accurate and consistent data which can help identify drivers at risk of accidents, especially severe accidents. Using machine learning technology data scientists can identify the patterns of work and rest from a drivers ELD that point to high-risk work schedules. This group of drivers typically represents around 10-12% of any driving population and once identified, targeted risk management interventions can be applied to mitigate risk. Sleep education is the first step followed by bio-compatible scheduling of future loads and appointments times, and if required, working with shippers to help them qualify as a Shipper of Choice.

## **SHIPPER OF CHOICE**

There are a number of things shippers can do to improve the working relationship with their motor carriers. This includes paying for freight in a timelier manner, unloading and loading trailers as quick and safely as possible reducing dock detention time, treating drivers with respect, providing adequate rest areas and parking for drivers, being more flexible with appointment times and communicating more frequently with drivers. With ELD's now in place every minute spent on a dock takes away from the driver's weekly allotment of hours to drive—if shippers aren't paying detention time then time is money.

## **TRUCK ERGONOMICS**

One of the key ingredients to good quality and quantity sleep is a cool and dark sleep environment. Fleet Managers should always ask truck manufacturers to eliminate windows in sleepers and/or provide curtains,

so light can be completely blocked out. The optimal temperature for sleep is between 64 to 66 degrees Fahrenheit for most people making the installation of auxiliary power units (APU's) to run air condition systems and evaporative coolers a must-have safety and productivity technology.

This is an important subject since studies show that when we compare fleets using paper log fleets exclusively to fleets running electronic logs, we found over a 6 year period fleets who ran paper logs had a 30% lower DoT Recordable accident (fatality, injury or vehicle towed) rate compared to fleets on electronic logs.

Being compliant to unsafe regulations won't make your fleet safer, so make sure you separate safety and compliance into two separate business functions and apply your resources accordingly.

*Dean Croke is chief analytics officer at FreightWaves.*



**TIME, MONEY, AND THE HUMAN  
APPROACH: HOW TO ATTRACT  
AND KEEP QUALIFIED DRIVERS**

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**ASHLEY COKER**

**DRIVER TURNOVER IS ONE OF THE BIGGEST** (and most buzzworthy) problems facing carriers today. Its difficult to maintain business as usual with a high annual turnover rate, especially with rates reaching into the 90s for the largest carriers. The constant hiring cycle has wary companies wondering how to keep drivers from walking away, and research suggests that, while money is a big piece of the puzzle, it may not be the only piece that matters.

Driver iQ, a company that provides background screenings and driver monitoring services, conducts driver recruitment and retention surveys. The company’s aim is to better understand recruiting and retention experiences and expectations, according to the survey report.

Survey respondents were recruitment managers who operate over 75,000 trucks. The majority of the answers came from large carriers with over \$100 million in gross operating revenues, but recruiters for mid-size carriers grossing \$30-\$100 million and small carriers grossing under \$30 million were also included.

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The company asked why drivers were leaving fleets during its first quarter 2018 survey and the results came back crystal clear. Of the 18 options Driver iQ presented, total compensation, time away from home and predictability of paycheck were the most chosen by far.

However, the company’s second quarter 2018 recruitment and retention survey found that, on average, carriers expect driver turnover to continue to climb even as driver pay increases and sign-on bonuses become the norm.

Driver iQ Co-President Lana Batts attributed this, in part, to a disconnect between how high recruiters think salaries need to be and how high salaries would actually have to be in order for drivers to maintain the quality of life available to them almost 40 years ago. When asked what the total compensation package would have to look like to slow down the turnover trend, she said the

majority of recruiters choose \$75,000.

“Now, that’s interesting because if you took what a driver was getting in 1980 and did an inflationary number on that, the number would be \$110,000,” she said. “I just don’t think there’s a real expectation of what

it's going to take. Would \$75,000 put a dent in it? Oh yes. Would it solve it? No.”

Digging deeper into the research, however, suggests that something beyond just better pay may be at play. When results were broken down by carrier size, it became clear that there is a difference between how large and small carriers think about turnover. Large carriers reported expecting turnover to increase in the coming months, while small carriers expect to see a decrease. Their expectations seem to be in line with what has been happening across the industry, according to Batts.

“If you notice, last quarter, there was a 30 percent difference between the turnover rates of the large and small carriers, and if you plot it out, there has been a downward trend for the smaller and a slightly upward trend for the larger,” Batts told FreightWaves in July 2018. “We haven’t seen that kind of a split since 2015.”

These numbers seem to fly in the face of the common belief that driver turnover is the same for all companies, but things have not always been so varied. Over time, the American Trucking Association’s statistics show times when large and small companies rest at very similar turnover rates. The last four quarters do seem to favor the small carriers, though. While it is not yet clear if this turnover gap is representative of a larger trend, Batts believes drivers are staying with smaller companies more often for two key reasons: home time and the community feel.

As one of the most-cited reasons for driver turnover, it’s no surprise the promise of more home time attracts drivers to smaller carriers. What is more unexpected and harder to quantify, however, is the idea that the familial feel in smaller companies helps them hold onto workers longer than larger companies, which often lack the human approach. Over one-third of fleets surveyed reported 6 to 10 percent of their seats as unfilled, but smaller carriers fared better in this respect as well.

“‘Cheers’ was right. Where everybody knows your name is whole lot better than where you’re just a number. That’s cliché, but I think it’s actually true,” Batts said. “Combine that with more home time, since smaller carriers tend to have smaller geographic regions. I think the pay raises are having more impact on the smaller carriers because the guys and gals are getting home more often.”

The majority of small carriers also found that drivers are not retiring as expected, while 65 percent of large carriers found that drivers were retiring as expected. Batts thinks this may be due to the same reasons smaller carriers are experiencing less turnover.

“For retirees in general, the Bureau of Labor Statistics has found that people stay because they love their jobs,” Batts said. “You can then take that to the small carrier and say, ‘You know, I’m getting home when I want get home. I just got a nice increase. They know my name. Maybe I’ll stay.’ I don’t know how you prove that, but my sense is that it’s because they like working for smaller companies.”

For companies experiencing high turnover rates, the solution is undoubtedly multifaceted. Drivers have made it clear that issues like compensation and home time will have to be addressed if a carrier is looking to win their loyalty. But in the midst of balancing budgets and planning routes, it may be worthwhile for larger companies to learn their employees’ names.

*Ashley Coker is a staff writer at FreightWaves.*





# **UPGRADING DRIVER RECRUITING**

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**LAURA ZIELINSKI**

**TO SAY THE TRUCKING INDUSTRY** is in a bad place is putting it lightly. Demand is up, but drivers are definitely down. Even still, the situation is nowhere near hopeless. Small shifts in carrier recruiting and retaining practices can mean the difference between parked cabs or full loads on the road.

Driver recruitment vendor CDL Marketing has spent the last decade filling carriers' empty trucks via a variety of technology solutions. Ben Onnie, COO, has participated in the industry from several angles including recruitment, and has recommendations for carriers to battle the shortage.

"Over the past few years, CDL Marketing has experienced tremendous growth," says Onnie. "We have an interesting perspective on the industry, as we work with most major trucking schools and carriers who offer training. Additionally, we recruit experienced company drivers and owner operators for hundreds of carriers."

## **RECRUITING**

From trucking school acquisitions by large carriers, to logistics companies creating job options for all driver types and experience levels, to attempted regulation adjustments on driver age, no one could say carriers have been blind to and unmoved by the capacity crunch. However, only those actually changing up their game to meet demand are seeing success.

"Many of our customers are getting more focused on the actual recruiting process and understanding why they would lose a candidate in the funnel," says Onnie. "Carriers are leveraging technology to become more efficient. They are getting the most out of their recruitment marketing, with no stone left unturned."

Automation and new technology can cut out some of the laborious work recruiters have historically done, and process improvements to keep interested applicants moving forward. "Optimized user flows, better candidate experiences, and shorter, more mobile friendly applications are working strongly in the carriers' favor," says Onnie.

Besides back-end upgrades, carriers need to cross-channel market to win interest. Appealing ad material and multiple touchpoints separate one carrier from another in the eyes of a driver. "Carriers must be innovative and leverage strong design, video, and social media to attract drivers," says Onnie. "It often takes multiple interactions to get a submission."

If carriers want to attract new, younger drivers, then offer the type of tech they have grown up with and have become dependent on. Staying connected is a priority for many drivers, both new and seasoned.

“Give them WiFi, a flat screen, Netflix, and ways to connect with people, such as a webcam, in their downtime,” says Onnie. Shiny new trucks stocked with technology and creature comforts carry a big incentive for prospective drivers to sign on.

The incentives carriers can roll out are endless. Offerings such as company-paid training programs—including more private fleets entering the training space—strengthen applicant intent, and Onnie believes even more carrier-owned schools and enticing training programs will pop up in

the near future.

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#### **RETAINING**

Moving past recruitment and into employment, turnover remains high for many carriers, a reflection of the driver demand. A truck driver is the most common job in 40 out of 50 states, and interestingly, there are over 10 million CDL holders throughout the U.S., but many are not active. Making the job more appealing to drivers will only help fight the shortage.

Carriers who have been adjusting their business models to offer more home time (with the tradeoff of touch freight) seem to be winning on that front.

“We are recruiting for more local, dedicated, and regional runs than ever before,” says Onnie. “Carriers who don’t adjust their model will pay a premium for drivers.”

Additionally, fairly strong pay increases and retention programs—including payouts and benefits—can help secure driver longevity.

Carriers should highlight where drivers can reach financially, and show them that trucking isn’t a dead-end career.

“Increasingly more options are being made available that offer a career path,” says Onnie. “These start with training to become a company driver, to leasing a truck, to becoming an owner operator, and then to building a fleet of his or her own.”

Carriers who have already increased pay, offered better and shorter routes, upped their equipment, and added growth paths but are still

struggling to keep drivers from hopping to the next company should go to the source themselves.

“Survey your drivers; let them speak, and then deliver,” says Onnie. They may provide the additional insight needed.

## **CONCLUSION**

The trucking industry has problems that run deep, and repairing it won't happen overnight. However, using technology in recruitment and innovation in retention will make a difference.

“No one knows for certain what the future holds, but I'm always going to figure it out by the time it comes,” says Onnie. “We plan and adjust to be ready for it.”

*Laura Zielinski is a recruiting strategist for CDL Marketing.*



# **IS THE LOGISTICS MARKET EFFICIENT?**

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**GREG CALLEGARI**

**LATELY WE HAVE HAD A NUMBER** of startup companies coming to see us with aspirations to disrupt this industry. In short they believe that because gross margins are 15-18% or greater the market must be inefficient. After all, they argue, look at the stock market, the spread between bid and ask on stocks is a fraction of a percent; surely the logistics market can be closer to that. Most of them are very bright technologists but few have meaningful experience in the industry.

The argument continues that if we could just match every trucker with every shipper than we can reduce the margins to a fraction of a percent and shippers would save the difference, right? This, they argue in theory, can be solved by technology just like a “stock exchange,” an all-encompassing one-step solution.

Unfortunately, although we all believe in technology and know it transforms every industry it touches the solution is much more complicated. What many new startups are focusing on is the gross margins as a measure of efficiency, however a closer look at net margin yields an entirely different picture. The big truth in our industry is that there are services included in gross margins that really make the market quite efficient for shippers and

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reduce brokers net margins to mere basis points.

Let’s take a look at three public logistics companies from data gathered from Morningstar, XPO, Echo and Radiant. The gross margins for fiscal year-end 2017 (a good year for logistics) were 14.82% and 17.45% and 25% respectively, yet the net margins were remarked lower. XPO’s was 2.03%; Echo’s was just .65%; and Radiant was only .36%. However these are three highly regarded, well-managed top firms. Why are net margins so much lower than gross?

The reason is because brokers are providing a number of services to shippers that cost the brokers most of that gross margin. At most brokerages what eats up their margins is technology, insurance, price discovery and execution, claims and the high touch experience that is required to get a customer what he wants when he wants it. These are supply chain costs that need to be borne by someone in the process.

Realistically, while 100 shares of IBM stock are 100 shares of IBM stock everywhere on the planet, a full truckload delivery from Boise to Chicago varies by dozens of factors that affect the price. There could

be 50 of what we call “touch points” or factors that influence costs and maybe unique to that particular shipment or shipper. Consequences such as time of delivery, time of pickup, condition of the trailer, fragility of the cargo, temperature of the cargo, loading/unloading requirements, risk of loss, value of the cargo, tracking requirements, insurance requirements, technology interaction with the shipper, weather, availability of assets, and many more factors effect margins. Just the fact that carriers get paid in 1 day and shippers pay in 30-90 days or longer affects the time value of money and influences costs and margins meaningfully.

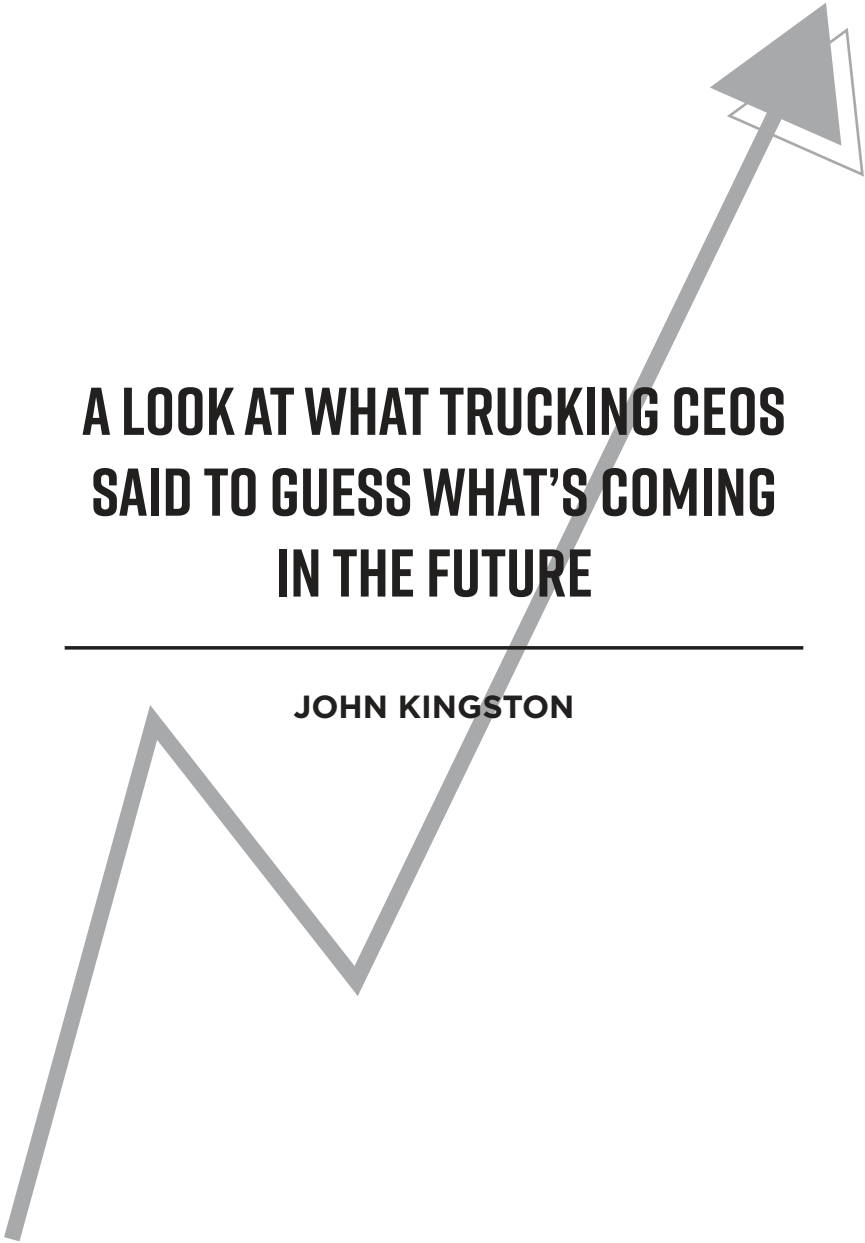
Shippers can, if they elect, transfer all these touch points in-house but the reason why most have not is because they realize that the industry veterans and experts in this business who have dedicated years and billions to the time and technology to make this market efficient can barely squeeze 1% net margins, and that’s when they get it right. In years or quarters where there are sudden changes in demand, weather or capacity, brokers often bear the losses.

So we believe, from a shipper’s perspective, the logistics market is efficient and it would be difficult to enact one solution or “stock exchange” for shippers and carriers that will reduce gross margins substantially. This is because of all the risks and costs of the supply chain that have to be paid by someone.

Brokers and the market can and will become more efficient because that is what technology does. Firms like us are already working on modeling these touch points to make the market more transparent and increase the productivity of our employees. Our carrier group has had a 2.2x increase in productivity over the last 4 years (by using internal metrics such as loads per employee, revenue per employee and others) by implementing new technology that allows them to access carriers that better fit our clients needs. This trend is continuing but further gains will be harder to achieve without continuing substantial outlays in technology and utilizing very smart creative people.

Today a customer called us about an hour before the pickup, and we moved a load of 40,000 lbs. 300 miles, and the goods were delivered on time, as promised with no incidents or surprises. The net profit was about \$10. I would say that was pretty damn efficient.

*Greg Callegari is chairman and co-founder of Edge Logistics.*



**A LOOK AT WHAT TRUCKING CEOS  
SAID TO GUESS WHAT'S COMING  
IN THE FUTURE**

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**JOHN KINGSTON**



**BY THE TIME YOU ARE READING THIS**, the second quarter of 2018 will be a distant memory. The third quarter of 2018 will be in the books too, and you probably are coming off a few weeks of hearing how trucking companies and related companies did during that three-month period. But we're writing this before those results were rolled out to the world.

So why are we looking back? We listened to plenty of earnings calls in the second quarter, though we do that every quarter; it wasn't unique. Still, like a soothsayer predicting the future after it happened, there can be some hints on what may have happened in quarter three of this year—and by extension, quarter four and into 2019—on the basis of what was being said back in late July and early August. Barring some major occurrence between early August and late September, there were trends in the transport market that came up repeatedly in the comments of corporate executives, who suggested that they weren't going away anytime soon. Let's review some of them.

The third quarter of 2018, if the predictions were correct, was not going to look as great in comparison to the Q3 2017, but largely for one reason: the third quarter of 2017 is when the great freight bull market began. Whether it was a combination of the secular tightening that continues today, or the boost that was given from hurricane relief efforts from Hurricane Harvey and other storms, executives—and analysts—warned that these terrific-looking comparisons—"comps" in analyst lingo—were not going to be as strong as they were in the prior four quarters. The fourth quarter would be the same. But that doesn't mean the market is slowing. Far from it....

...which leads to the next theme heard repeatedly on the calls: there are simply no signs of a slowdown. David Jackson, the CEO of Knight-Swift, talked about the market in terms that could have been employed by any one of a number of CEOs: "So far every season since the fourth quarter, since early in the fourth quarter, has been much stronger than the normal seasonality," Jackson said, according to a transcript of his company's conference call with analysts provided by SeekingAlpha. "So on the demand side, it hasn't looked this good in a long, long time over a decade. You'd have to go back to the last time that we saw economic expansion which was over 10 years ago."

Even in a strong market, as the earnings results rolled out, it was clear that investors were ready to punish companies that didn't meet expectations. For example, speaking of Knight-Swift, its truckload division had a tremendous second quarter, with an operating ratio of 77.7%, blowing away its truckload competitors. That marked an increase of almost 700

basis points. But investors had been sour on the stock all year, and its report of some problems in its refrigerated division, as well as a weak projection of how it was going to do in the third quarter, sent its price tumbling.

Part of that weakness could be back to the idea held by some investors that the peak in trucking already had arrived. In the middle of earnings season, on July 24, trucking stocks across the board flattened, and some analysts said many investors were thinking that the surge in demand, the tight capacity, in short, all the factors that had created such strong second quarter earnings couldn't possibly continue. So we'll go back to another executive's view of the future, this time from Old Dominion executive chairman David Congdon: "When you look across nearly every economic indicator, from the inventory sales ratios, GDP, industrial production, ISM, construction spending, retail sales, you name it, the macro economy is

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strong and certainly, we do—everyone's—there's a notion out there in the most recent days that we've reached some kind of a peak and everything's going to go to hell or something. I don't know but I don't believe it."

Even in such a strong market, operating ratios were all over the board. Besides the previously-mentioned Knight-Swift sub-80% OR for its truckload division, LTL carrier Old Dominion also posted a sub-80 OR, the first time in its history it had done so. But focus on just OR can be insufficient. For example, J.B. Hunt's outstanding quarter was highlighted by factors other than OR, which division-by-division ranged between 88.5% and 95.7% (according to estimates from Merrill Lynch). What was more important in its eyes were the statistics for such categories as revenue per truck per week, which all came in strong. The

pattern tended to be that those companies with strong ORs boast about them, and those with weaker ORs cite other statistics as being more meaningful.

One area where OR was definitely not downplayed was in the railroad sector. CSX and Canadian National both posted ORs less than 60%, with all of the other class 1 railroads on either side of 65%. The link between CSX and Canadian National? Both have implemented or are implementing precision railroading, the radical operating philosophy created by the late Hunter Harrison, first at smaller railroads, then CN and later at CSX, where

he headed the company for just eight months before unexpectedly passing away last December. The gap between the two companies that had adopted precision railroading—with its tight staffing, reduction in hump yards and a move away from hub-and-spoke systems—was most stark in those ORs. One analyst actually had the temerity to ask an executive from another railroad: don't you think you need to do some precision railroading? Norfolk Southern's CEO James Squires summed up the general sentiment heard from those executives with their 60+ ORs by saying: "We are always open to best practices driving for shareholder value, and I am very confident we are on the right track." The irony for CSX becoming the darling of analysts is that in the first part of the year, its service was a mess, leading to an enhanced overview by the Surface Transportation Board and a self-described "apology tour" by CSX management. By late spring, CSX could declare that improvements in the system meant the apology tour was over. To help support the idea that OR is not everything, in mid-August Deutsche Bank upgraded its recommendation on Norfolk Southern to buy from hold. And while the bank said NS' possible inability to lower its OR was a "risk to the downside," that didn't stop it from raising its price target.

Some companies are willing to talk about pricing; others are not. But based on the numbers that were heard during the conference calls, you can assume that right now, a lot of shippers are paying either side of 10% more than they were last year for the right to move their freight. And if it's in a lane that isn't particularly competitive, getting up to 15% might easily be the number.

All executives said that driver retention was a problem. But many of them boasted about their own efforts to attract and retain drivers. Several of them cited the prior six months as the best in five years—or whatever length—for their companies' retention programs. The LTL carriers were obviously in a stronger position to make that claim, since their drivers get home most nights. But if all you knew about driver retention was from the conference calls of the leading publicly-traded carriers, you'd know that there was a crisis in attracting talent but the company on the line had successfully managed to overcome it.

All the numbers pointing to healthy order books at the OEMs were cited by some executives as another sign of a strong market. But there was clear reluctance by anybody to say: see, this is new capacity. Rather, there were references to enhanced safety features in the new vehicles and the impact of a shiny new truck on driver workforce issues. Curt Stoelting, the CEO of Roadrunner Transportation, which has lined up new financing

sources as it attempts to come back from a series of accounting irregularities and a federal investigation of them, pointed to the ability to buy new trucks as a big plus. “When it comes to recruitment, don’t discount the new equipment...and the upgraded equipment that we will be putting into the network both for company drivers and independent contractors,” he said. “That’s also a key recruiting and retention tool.” It’s almost impossible to find anybody who said, the industry is ordering a lot of trucks, so we’ll have a lot more drivers.

A few months later...how are these forecasts and observations holding up?

*John Kingston is executive editor at FreightWaves.*

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