WHITE PAPER:
DIGITAL DATA GATHERING

DIGITAL DATA GATHERING AND THE COMMERCIAL TRUCKING INDUSTRY

IMI understands that trucking is changing at a rapid pace, and that is significantly impacted by the increased adaptation of technology. With all of this additional technology comes a plethora of data that is gathered - how will fleets keep up?

In this white paper, we dive into:
- How does blockchain influence trucking?
- How can fleets better utilize data?
- What's the timeline for fleets to implement data gathering?
- How can fleets implement data gathering and analysis?

KEY TAKEAWAYS

Within this white paper, you'll find information on how fleets can leverage data to improve both the measurable and intangible aspects of managing a commercial fleet.

"Data" was one of the most popular buzzwords in almost every industry in 2018. While data is already enabling meaningful progress in trucking and beyond, it's important to remember that data on its own means very little. Data points are bits of information, not self-contained (or even visible) solutions. It takes data analysis, software, data-focused people, and a strategic approach to turn data points into improved fleet operations.

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INFORMATION OVERLOAD

Modern trucks and equipment are chock full of sensors and connectivity. Data science is advancing at break-neck pace. So why are many fleets slow to implement data-driven solutions? A single fleet can produce billions of data points throughout the year, which can be disorienting for fleet managers lacking a plan for data management. The task for fleets is now to put systems in place that not only collect data, but who are able to analyze the data points and put them to use. As Brad Taylor, Omnitracs' Vice President of Data and Internet of Things, reported to Fleet Management, "the industry focus has shifted from capturing billions of data points to helping improve fleet decision-making. For fleets, this means not just getting data, but determining actionable items from new big-data technologies."

LEVERAGING DATA

In his white paper "Make Global Supply Chains More Effective with Internet of Things," Dr. Shardul Phadnis divides the implications of IoT data into three broad categories. The first is information gathering: sensors will provide exponentially higher amounts of data, and more types of data, from a variety of sources. The second category is information sharing: non-serial data will be shared through Wi-Fi and cellular networks, instantly, without distortion or manipulation. The third implication of IoT data discussed by Dr. Phadnis is decision making. Decision makers will be able to leverage automatically-generated data sets, algorithmic processes, and predictive models to make better-informed decisions, the results of which will generate further data, which can be closely monitored to assess outcomes. This sort of feedback-based process opens the door for constant adaptation and optimization of the process being monitored.[1]

COST CONTROL

Data can be used to monitor many areas of a truck for maximum efficiency and cost savings. For example, Bridgestone currently offers the MEMS Evolution3, a data-driven system that monitors the tire pressure in Earthmover tires, records temperature and pressure conditions in real time, and sends alerts when pressure or temperature reach problematic levels.[2] While this technology is specifically designed for mining fleets, similar technologies have the capacity to soon be rolled out across the entire commercial trucking industry. For example, similar monitoring sensors are already being applied to a range of truck parts to monitor wear and performance.

Another area where data can help control costs is the current parking crisis, previously mentioned in the ELD mandates. Data can help to streamline parking and control costs through updated apps and websites. This year, MAASTO (an interstate transportation association that includes Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin) announced that it will be rolling out a data-driven parking solution targeted to launch in 2019. It will monitor more than 150 parking areas, relaying free information on parking availability to truckers via road signs, smartphone apps, and websites. That's a significant improvement over driving to each parking area to check.

While traffic congestion and equipment longevity can be accurately tracked to mitigate costs, one more temperamental factor affecting the commercial trucking industry is slightly more elusive: the weather. Currently, inclement weather costs US fleets $8.659 billion per year.[3] There are a number of data-driven offerings that help truckers plan for or avoid challenging weather conditions. If this sounds a bit like an overhyped weather forecast, it's not. Real-time weather data can be gathered from individual roadways and factored into existing weather forecasts. These insights can be combined with up-to-the-minute data about traffic, accidents, and road closures, and can serve alternative, time-saving routes to the driver's GPS—a massive upgrade over a color-coded radar map. Moving forward, it's likely that road-specific data will be gathered from every truck on the road—similar to current practices in aviation—to allow even more accurate forecasting across the industry.

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SAFETY

The efficient use of data can also make commercial transportation safer. Fleet managers can monitor a driver's average or maximum speeds and take corrective action as needed. Drivers can receive alerts when they're heading into heavy congestion—a big contributor to accidents—and reroute accordingly. Data reveals which drivers show consistently high speeds, heavy braking, or frequent lane departure engagements, allowing fleets to retrain drivers and incentivize safer habits.

INTANGIBLE BENEFITS OF DATA:

1. Correlations between weather and road safety
2. Insights into driver behavior
3. Time savings with clear route predictions

In 2018, the US Department of Transportation announced that it would be experimenting with both of these ways to use data to improve safety, launching two research projects.[4] The first will track the speed of anonymous trucks and see how closely speeds and road conditions correlate to accidents. The second experiment will use Waze, a crowd-sourced traffic and navigation app, in hopes of assessing the risk of crashes based on the reported hazards from Waze users.

MORE EFFICIENT MAINTENANCE

While data cannot currently predict all part failures, sensors and data can anticipate many routine problems and allow for convenient monitoring of equipment. Data from telematics devices and sensors can give clues as to which parts on a truck are wearing or nearing failure, enabling fleet managers to alert and advise drivers before a costly roadside breakdown occurs. Beyond the cost of the repair itself, unscheduled maintenance costs an average of $79.32 per hour, meaning smart data utilization can quickly pay for itself.[5]

DATA AND BLOCKCHAIN

As far as industry buzzwords go, "data" is hard to beat, but "blockchain" might just take the cake. While the data and blockchain go hand-in-hand—blockchain being a record of data—blockchain is certainly less understood. Before we jump into some of the ways that blockchain might bring change in trucking, let's first define what exactly blockchain is.

To begin with, it's not bitcoin. While bitcoin is an example of a blockchain, blockchain is not limited in application to digital, decentralized currency. Blockchain has been called a "truth machine," an "instrument of trust," a record of data, transactional or otherwise, that is not created, owned, protected, or restricted by any one party or centralized authority. Blockchains allow all users to see an open history of data that is secured by uncrackable cryptography. This is why the bitcoin blockchain, an open-source system with tens of billions of dollars just waiting to be stolen, has never been hacked.

But the reason the trucking industry is excited about blockchain is not because of bitcoin. At its core, decentralized blockchain technology is about establishing trust about data between parties. In the commercial trucking industry, like in most other industries, trust typically comes from long-standing relationships or trusted third parties, like banks. "Blockchain changes all that," Vernon Tirey, co-founder and CEO of LeaseQ, said in an interview with Truckinginfo.com. "The data can be trusted, because the network enforces the fidelity of the information."[6]

In the same article by Jim Beach, titled "Blockchain Shows Promise for Trucking," Tirey explains that he believes blockchain will affect three areas of trucking in particular. The first way is authentication. Basically, blockchain can be used to track goods on their journey through the supply chain. Giants like Oracle, IBM, and SAP are enthusiastically pursuing blockchain for this application. Appealing startups like Provenance are joining in. This seems to be a promising application for blockchain adoption in supply chain and trucking.

The second area Tirey mentions is finance. Blockchain lets cooperating parties verify that each has the money they say they do and will be able to pay on time. Blockchain enables "smart

> **"Blockchains allow all users to see an open history of data that is secured by uncrackable cryptography."**

contracts," which could potentially replace the need for so many lawyers by creating tamper-proof contracts. "If you talk to supply chain experts, their three primary areas of pain are visibility, process optimization, and demand management. Blockchain provides a system of trusted records that addresses all three," says Brigid McDermott, vice president of Blockchain Business Development & Ecosystem at IBM.[7]

The third way blockchain will impact trucking, according to Tirey, is in process management. Like with payments, process management can also be built into smart contracts. If a task creates data, that data can be used by the smart contract to indicate whether a party has kept up its end of the bargain. For example, where did a particular truck drive today? That data could go directly from the truck's GPS into the blockchain ledger—an automated process with guaranteed integrity. Blockchain can track, communicate, and share documentation and information to streamline and secure process management.

HOW BLOCKCHAIN WILL IMPACT TRUCKING:

1. Authentication - Tracking Goods
2. Finance - Verifying Transactions
3. Process Management - Tracking, Sharing, & Communication

What does the timeline for blockchain adoption in trucking look like? Some, like dexFreight, are already doing it. Chris Burruss, president of the Blockchain in Transport Alliance, was paraphrased in an article by Jim Beach titled "Blockchain in Trucking: Between Hype and Reality." "The current adoption forecast for the technology in trucking is education, case studies, and some early adoption between now and 2020. Between 2020 and 2025 will be a period of growth. Burruss predicts full maturity from 2026 onward."[8]

There are some hurdles for blockchain adoption in fleets. Most blockchains can currently process 3-20 transactions per second. That's fine for now, but it won't be fast enough for effective full adoption across the entire commercial trucking industry. The best blockchain codes are almost always open source, which makes commercialization hard and protection of intellectual property rights challenging.

Ironically, many believe blockchain will be transformative in protecting intellectual property in the future.[9] As for the open source code of the blockchains themselves, they can be quite difficult to control. The transparency of blockchain can also provide some concerns with its benefits. The ledger is open to anyone using the network, and while they can't tamper with it, they can see any information that isn't encrypted.

It seems likely that blockchain applications will become available to fleet managers and owners in the near future. They appear to represent the future of data storage and communication, although there are still some concerns to work out before blockchain goes mainstream in trucking.

INTERPRETING AND IMPLEMENTING DATA

Blockchain offers an innovative way to store and share data gathered from telematics devices. But the question still remains: how can a fleet manager go about implementing this data? The most accurate, efficiently-gathered data, stored in the most ironclad software, doesn't benefit fleets in the slightest if action is never taken based on that data.

Setting and Monitoring Benchmarks

Developing benchmarks is a critical part of using data to evaluate truck safety, part performance/wear, efficiency, and compliance. Is your fleet performing as well as it could be? How is it stacking up compared with others in the industry? Without benchmarking and monitoring, fleet managers can't really know; there is no clear baseline, no context for the data being gathered. Prominent consulting firm Bain & Company breaks the benchmarking process into six basic steps[10]:

1. Select a product, service or process to benchmark
2. Identify the key performance metrics
3. Choose companies or internal areas to benchmark
4. Collect data on performance and practices
5. Analyze the data and identify opportunities for improvement
6. Adapt and implement the best practices, setting reasonable goals and ensuring company-wide acceptance

A critical part of the above strategy is choosing which key performance metrics, more commonly called key performance indicators (KPIs), to track. Common safety KPIs include measures like speed and acceleration/deceleration, as well as peak times during which unsafe incidents occur. Efficiency KPIs might include total cost per pound of goods delivered, fuel consumption, idling time, rpm range, and shifting habits. KPIs tracking part performance and wear include road calls, parts purchased, cost totals, and maintenance costs. Compliance KPIs are often straightforward and easy to track through ELDs.

Data Management

Data just keeps getting bigger, but fleets often lack the personnel to handle all of the gathered data in-house. "What's happened over the past 10 years is that the analytics support staff that fleets may have had is now gone," said Utilimarc partner Chris Shafer in an interview with Fleet Financials. "So there are no bodies left and no talent left to do that hard core analysis that's needed to uncover the magic of that data and the potential of that data."[11] Still, many fleets are capable of making data-driven improvements with the staff on hand. By defining clear objectives and focusing on a few high-impact KPIs, fleets can avoid getting overwhelmed and make real progress without investing excessive time into analytics. Many ELDs on the market make it easy for fleets looking to leverage a little more data in their day-to-day with dashboards and reporting tools that highlight useful indicators like driver speed, acceleration behaviors, and idling times.

Beyond this sort of "entry-level" data management, translating immense amounts of data into bigger strategies can be an expensive, time-consuming, inefficient task for many fleets to tackle on their own. To combat this challenge, there are a host of data services available to fleets on the market today. Most take the data generated by a fleet and turn that data into an implementable plan with accompanying spreadsheets, graphs, and progress trackers. There is no shortage of options for fleets looking to leverage data to keep up with vehicle maintenance, driver habits, route optimization, fuel consumption, operating costs, and more—without having to deal directly with an unending flood of raw data.

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