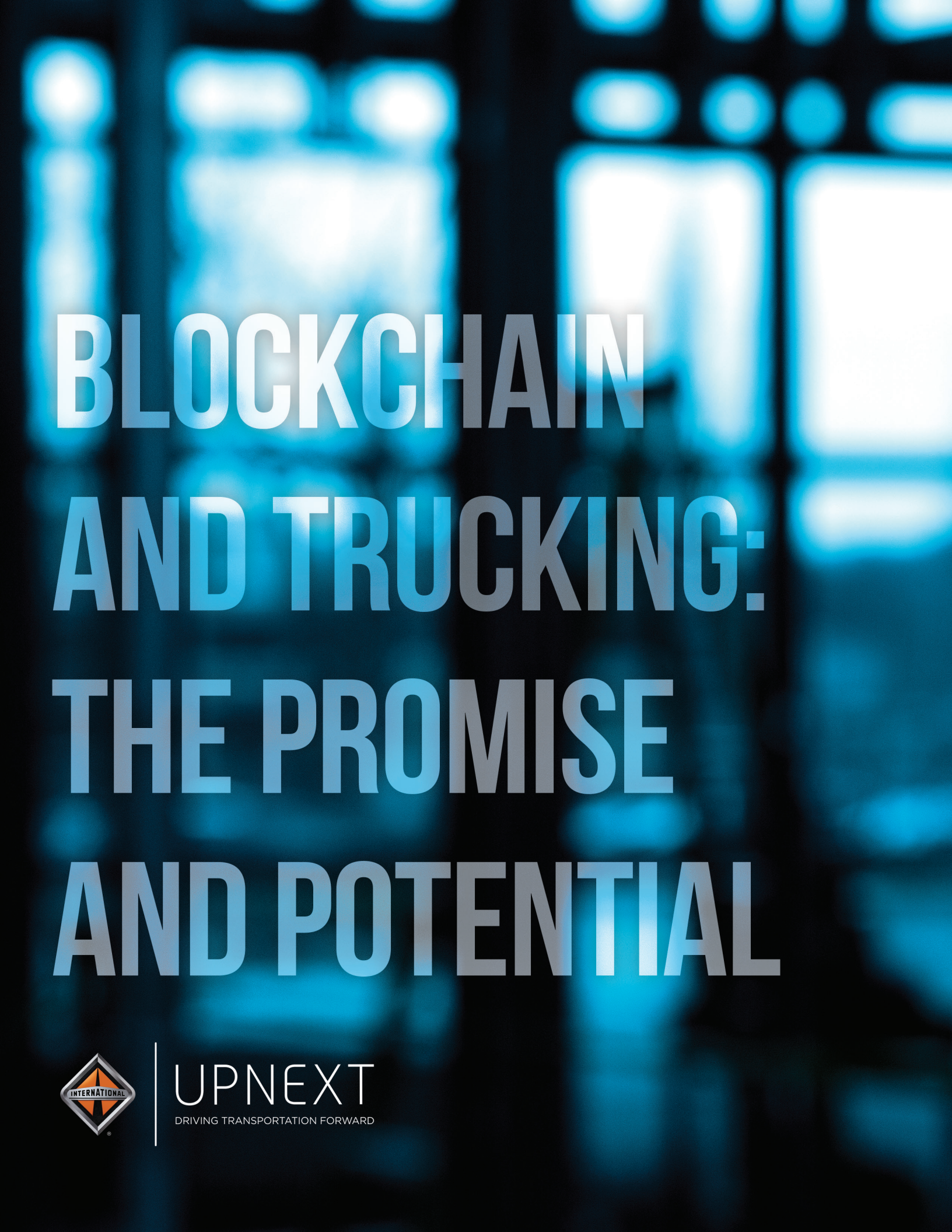

# BLOCKCHAIN AND TRUCKING: THE PROMISE AND POTENTIAL

INTERNATIONAL

UPNEXT

DRIVING TRANSPORTATION FORWARD

# INTRODUCTION

Blockchain, sometimes referred to as distributed ledger technology (DLT), has been making a lot of headlines lately in business news. The general public might associate blockchain with Bitcoin. However, those in the business world – particularly the financial universe – fully understand that this technology is far removed from the tremendous risks of this popular cryptocurrency (although blockchain technology did originate there).

So why the buzz around blockchain? Simply put, it's a very streamlined, cost-effective, and transparent way to record and validate transactions. For any business that transacts any product or service of value, and what business doesn't, blockchain has the potential to transform how things are done.

## IN THE TRUCKING INDUSTRY, BLOCKCHAIN COULD BE USED TO STREAMLINE FREIGHT TRANSACTIONS BY ENHANCING:

SECURITY

VISIBILITY

THE ACCURACY OF DATA

Using blockchain, freight can be tracked throughout the supply chain, and freight services monitored carefully on a shared digital network, keeping commodities safer and maximizing efficiency. Other potential use cases for the trucking industry include expedited payments, stronger fraud detection, easier compliance, and more.

Of course, the key word is “potential.” While blockchain clearly holds a lot of promise, it is still a technology in its infancy. Nevertheless, International Truck believes this to be an emerging innovation that is worth further exploration and research because of its probable impact on our industry.

In this point-of-view (POV) document, we’ll clarify what blockchain is (and isn’t), delve into the most promising use cases, and explore potential applications at International Truck.

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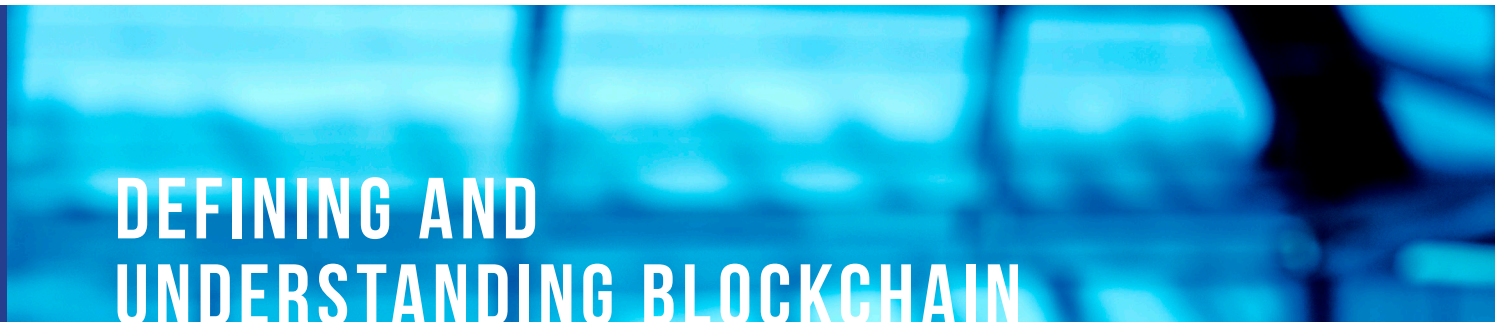


# 01 DEFINING AND UNDERSTANDING BLOCKCHAIN

You can't define what blockchain is without making it abundantly clear what it is not. **It is not Bitcoin.** It may take some time, however, for this to sink in with the masses, given the undeniable connection at its roots. After all, it is the underlying ledger technology that has played an integral part in putting Bitcoin on the map. Once that disassociation is clear, the next natural questions are:

## "WHAT IS IT?" & "HOW DOES IT WORK?"

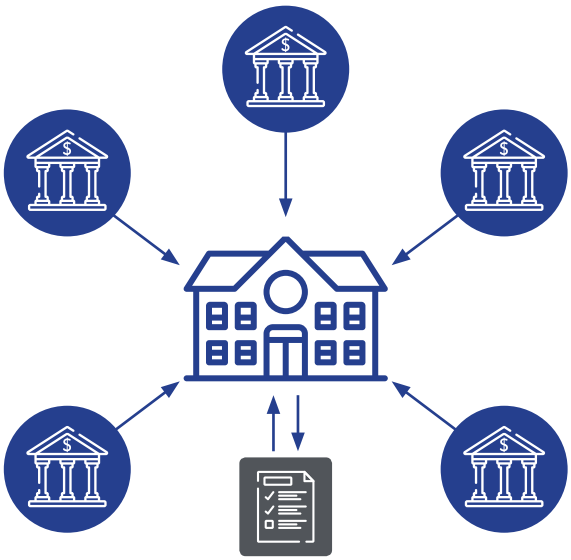
As one of the premier technology supporters of blockchain, IBM has gone to great lengths to answer those questions and more. In its report, Blockchain for Dummies, IBM offers a simple definition:

***"Blockchain is a shared distributed ledger that facilitates the process of recording transactions and tracking assets on a business network. An asset can be tangible – a house, a car, cash, land – or intangibles like intellectual property, such as patents, copyrights, or branding. Virtually anything of value can be tracked and traded on a blockchain network, reducing risks and cutting costs for all involved."***

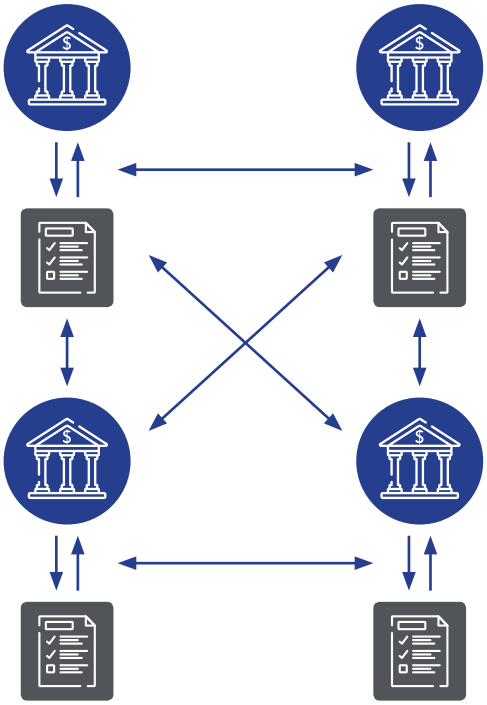
So, how does this "shared distributed ledger" differ from any other form of managing transactions? Most forms of recording, validating, tracking, and finalizing transactions within an organization's business network happen through a centralized process. Asset movements are tracked, for example, within the company – as well as any outside financial institutions – using a central authority, such as a back-office department or third-party clearing house. As we've seen throughout history, these centralized systems are susceptible to manipulation and fraud. These central departments or authorities aren't always efficient either, and typically add substantial overhead costs to each transaction.

With blockchain, there is no central authority, so those inefficiencies and costs related to recording, validating, settling, and managing transactions are virtually eliminated. The ownership of assets is tracked and certified through a shared network of many institutions. Any transactions are verified on an open and shared ledger for all (authorized) parties to see, cutting down on the possibility of fraud or manipulation. Without the need for a central authority, back-office departments or outside clearing houses are no longer needed, dramatically decreasing overhead, while increasing transparency and security.

## CENTRALIZED LEDGER VERSUS BLOCKCHAIN[1]



A centralized ledger tracks asset movement within the financial systems between institutions.



A distributed ledger eliminates the need for central authorities to certify asset ownership. Instead, it is held and verified by many institutions, to cut down on fraud and manipulation.

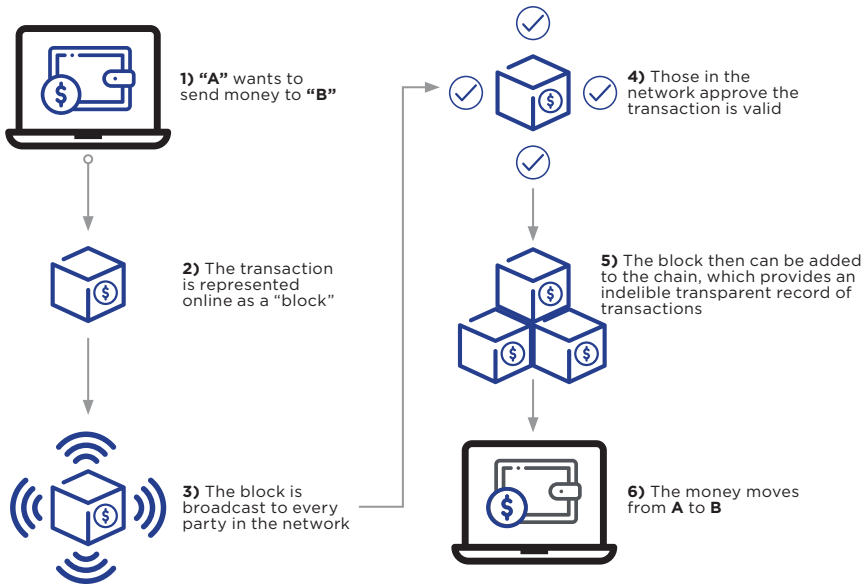
# 1 HOW BLOCKCHAIN WORKS

To understand how distributed ledger technology works, it's helpful to look at why it's named blockchain. The term "blockchain" actually refers to the way transaction data is stored. This is done in transactional "blocks" of information that are linked together to form a chain.

As transaction numbers grow, the blockchain grows along with it. Each block includes a record and confirmation of the time, as well as the sequence of transactions, so there's no possibility of someone inserting data between blocks for fraudulent or misleading purposes. The data is transparently logged and locked into the blockchain.

Ideally, this all happens within a discrete network governed by rules and standards that all the network participants must follow and abide by. This is particularly important in any industry with private institutions, such as trucking. Only the participating players, such as suppliers, shippers, and brokers, can participate in their blockchain network.

## AN EXAMPLE OF A SIMPLE BLOCKCHAIN MONEY TRANSACTION




## KEY CHARACTERISTICS OF BLOCKCHAIN

### IMMUTABLE

- Distributed database that maintains a continually growing list of records
- Managed by a peer-to-peer network with protocol validating new blocks
- More than half of the network would have to participate to change recorded data

### TRANSPARENT

- Each block holds a timestamp of a transaction and links to a previous block
- All users have identical visibility of ledger information
- Designed to prevent data from being altered

### SECURE / AUTOMATED

- Blockchain lacks a central point of vulnerability, all data stored across network
- Transactions in blockchain can be customized and automated as necessary

### TRUSTLESS OPERATION

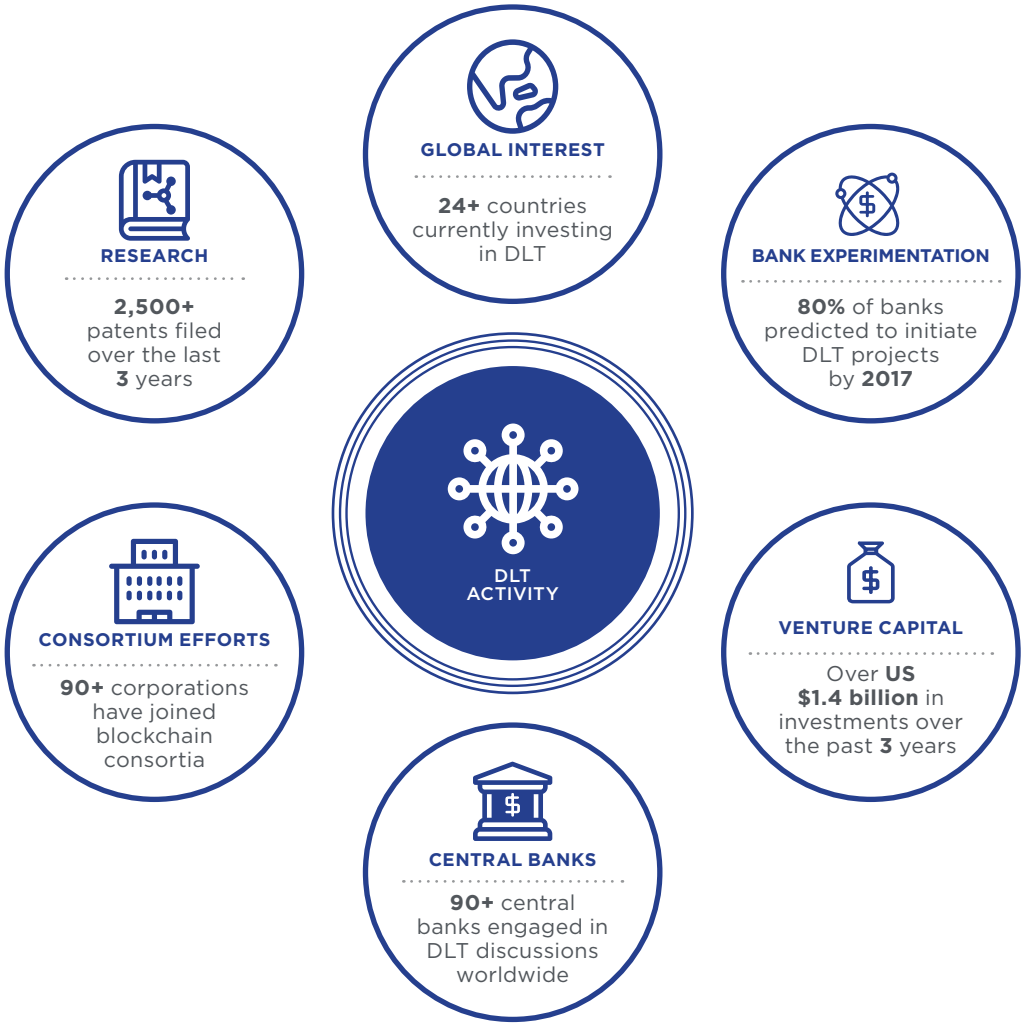
- No centralized "official" copy of records exist
- No user is trusted more than any other

## 2 HOW BIG OF A DEAL IS IT?

Like any emerging technology that shows great promise, there's a lot of hyperbole about blockchain in the news. Headlines have exalted everything, from it being as big as the birth of the internet to it revolutionizing every industry.

Eventually, time will tell what its impact will be, however, a possible predictor of its importance is the current major global interest and investments focused on distributed ledger technology. For example, several well-publicized pilot programs are underway, including a coalition of IBM, Walmart, Unilever, and seven other food companies. This coalition is currently introducing blockchain into their food supply chain to reduce contamination risks. The vast majority of major banks around the world – over 80 percent – have some sort of blockchain testing or pilot program in process.

### DLT (BLOCKCHAIN) ACTIVITY AT-A-GLANCE[2]



# 02 BLOCKCHAIN AND TRUCKING

For the trucking industry, blockchain offers benefits in interoperability and visibility within the supply chain. It could also be a means of linking companies currently using different operating systems, which could help reduce industry inefficiencies. And, with the push toward a digital supply chain, blockchain can:

- Streamline transport and logistics processes
- Improve order accuracy
- Help track many types of physical assets, such as trucks, trailers, and containers
- Secure freight bill pay
- Audit transactions across freight brokerage and dedicated carriage operations

Many in the industry contend that blockchain will likely impact contract transactions most heavily in the beginning, with warranty and truck parts supply chain transactions following closely behind.

## BITA USE CASES

The Blockchain in Transport Alliance or BITA (originally Blockchain in Trucking Alliance) has identified eight use cases that apply to the transport industry in the major areas of performance history, optimization, and payments and pricing.

### PERFORMANCE HISTORY

Blockchain could allow parties to see solid and definitive evidence of past performance in all the relevant metrics. This removes the “trust” aspect from all deals.

### VEHICLE MAINTENANCE

Blockchain facilitates item-by-item records of vehicle repairs, with no need to rely on any individuals or entities to record and store an extensive repair history. Plus, this history moves as the equipment moves for anyone to see.

## QUALITY ASSURANCE

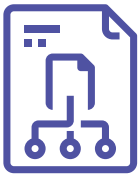
With a distributed ledger, everyone involved in a transaction has access to all data points. Disputes can be reduced by simply taking photos and evaluating freight at pick-up and delivery locations, all shown on the blockchain.

## CAPACITY MONITORING

Available capacity can change any time throughout the day. Blockchain offers transparency to know when and where capacity opens up, so all parties can take advantage of shifts in demand.

## FRAUD DETECTION

Everyone on the blockchain network can see every transaction with the assurance that nothing can be removed. Fraud and double brokering can virtually be eliminated with distributed ledger technology.



## COMPLIANCE

Blockchain and electronic logging devices (ELDs) can work flawlessly together. ELDs can stream data to the blockchain in real-time. Plus, when this data is paired with traffic, weather and other real-time information, up-to-the-minute rerouting is possible.

## PAYMENTS AND PRICING

Processing and settlement of payments is secure on the blockchain with all transaction information easily accessible. Rates can also be more easily determined with detailed historic payment records.

## THEFT PREVENTION

The blockchain can contain detailed information and rules. These can even include ID pictures and rules for the pick-up and delivery of the freight, increasing security and reducing the possibility of theft.

# 03 THE INTERNATIONAL TRUCK POV ON BLOCKCHAIN

At International Truck, we're optimistic about the potential of blockchain technology and intend to help lead the way in untapping this. In fact, our parent company, Navistar, is a member of the Blockchain and Transport Alliance, and shares its vision to "lead, develop and embrace a common framework and standards from which the industry participants can build revolutionary applications."

IN OUR VIEW, IN ORDER FOR BLOCKCHAIN TO SUCCESSFULLY MOVE THE ENTIRE INDUSTRY TOWARD GREATER TRANSPARENCY AND EFFICIENCY, CERTAIN OBJECTIVES MUST BE ACHIEVED:

- There needs to be a unified agreement on a standards framework, as well as protocols for uniform data entry.
- Blockchain for trucking must be a private network for authorized industry players (as opposed to a public network where anyone can see transactions).
- All players – large and small – must participate en masse.
- Blockchain applications need to be crafted to support common trucking-industry functions, such as tracking freight throughout the supply chain, or enabling driver payments.
- All applications need to be thoroughly tested for reliability, security, and seamless implementation.
- Policies should promote cooperation between all industry players.

# 04 INTERNATIONAL TRUCK EXPLORATION OF BLOCKCHAIN APPLICATIONS

At International Truck, we are currently in the process of researching the use of blockchain for specific trucking applications. They range from smart contracts, to billing, to maintenance records and more (see below for eleven areas currently under consideration).

As we research, and potentially test and implement blockchain applications, our chief objective will be to leverage distributed ledger technology to bring greater value to our customers, partners, and shareholders.

## POTENTIAL BLOCKCHAIN APPLICATIONS BEING EXPLORED

- SMART DIGITAL CONTRACTS – USAGE-BASED LONG TERM-LEASE
- EXPORT TRANSACTIONS / CROSS-BORDER SHIPMENTS
- OWNER OPERATOR LEASING MODEL
- IMPROVED BILLING / COLLECTIONS
- SOURCING OF FINANCE – DIGITAL F&I
- CAPITAL MARKETS TRANSACTIONS
- MAINTENANCE RECORD MANAGEMENT
- FIELD SERVICE CAMPAIGN MANAGEMENT
- SUPPLY CHAIN TRANSPARENCY
- COMPLIANCE
- FRAUD DETECTION / THEFT PREVENTION

# 05 CONCLUSION

Blockchain technology clearly has the potential to bring new levels of transparency and efficiency to every transaction, regardless of the industry. In trucking, there are many distributed ledger technology applications that hold great promise, from how quickly a driver gets paid, to determining the status of freight throughout the supply chain, to tracking the maintenance records of a truck. It's also likely that there are future game-changing applications that have yet to be imagined.

But, like any innovation in its infancy, standards, processes, and safeguards have to be put in place to ensure all players cooperate and benefit. Our parent company's membership in the Blockchain in Transportation Alliance reflects our commitment to helping to lead the industry in the right direction. And, our exploration of specific blockchain applications proves that we are committed to making International Truck more transparent and efficient than ever before.

## SOURCES


**1) Source: Wells Fargo "Future of Trade" presentation February 2017 and Morgan Stanley "Blockchain in Transportation" November 27, 2017**

**2) Source: World Economic Forum, Future of Financial Services Series, August 2016**



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