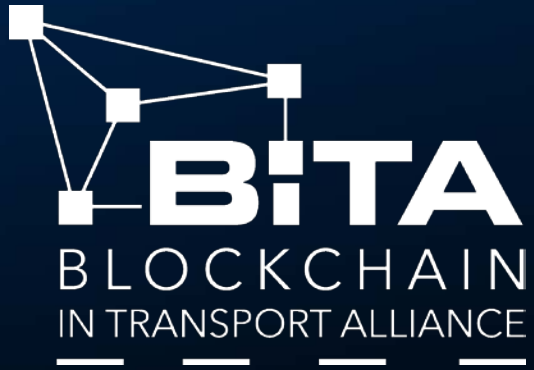


The Blockchain in Transport Revolution – Demystifying Blockchain

Chris Burruss, BiTA President

The Blockchain in Transport Alliance

BiTA: A Community & Standards Organization

BiTA

- Core focus is on community aspects such as networking, education, marketing and commercialization
- Will serve as the voice of BiTA to external organizations and stakeholders
- Technology and platform agnostic

BiTA Standards Council

- Forum specific to developing industry standards & best practices
- Initial focus will be on data formats and interoperability of blockchain platforms.
- A separate 501(c)(6) industry association governed by a standards board

Membership Trends

- 2020 Membership Applications
- 450 Paid Member Companies
- Membership/Collaboration Demographics:
  - Industry Participants (Truck, Rail, Air, Ocean, 3 & 4PLs, etc)
  - Shippers
  - Technology Sector
  - International Blockchain Organizations
  - Academia (Georgia Tech, Georgetown University, Northwestern, University of Central Arkansas, etc)
  - Federal Government (DoD, FEMA, FMCSA, Congress)
  - Trade Associations (ATA, TCA, Chamber of Digital Commerce, State Trucking Associations, etc.)
- Headquarters in Chattanooga, TN with an office in Singapore

BiTAS Board of Directors

- Ken Craig - MCLeod Software
- Dale Chrystie - FedEx
- Mahesh Saharanaman - UPS
- Mauricio Paredes - P&S Transportation
- Steve Hausman - Triumph Business Capital
- Dan Heinen - Kleinschmidt
- Tim Leonard - TMW a Trimble Company
- Amihai Zeltzer - Salesforce
- Craig Fuller - FreightWaves
- Scott Friesen - Echo Global Logistics
- Gil Perez - SAP
- Craig Harper - JB Hunt
- Lori Heino-Royer - Daimler
- Brad Taylor - Omnitracs
- Mike Dieter - Transplace
- Bart Boudreaux - BNSF
- Chris Burruss - BiTA (Ex-Officio)

Goals of the BiTA Standards Council

Develop industry standards that:

- Improve trust and enable transparency in the field of transportation logistics
- Drive technological efficiency, ideally resulting in cost savings for those who adopt the approaches defined by BiTA
- While not defining a single technology solution, BiTA will seek interoperability and compatibility between solutions used across the industry
- **BiTA standards will be open source, royalty free**

What the Heck is Blockchain Anyway??

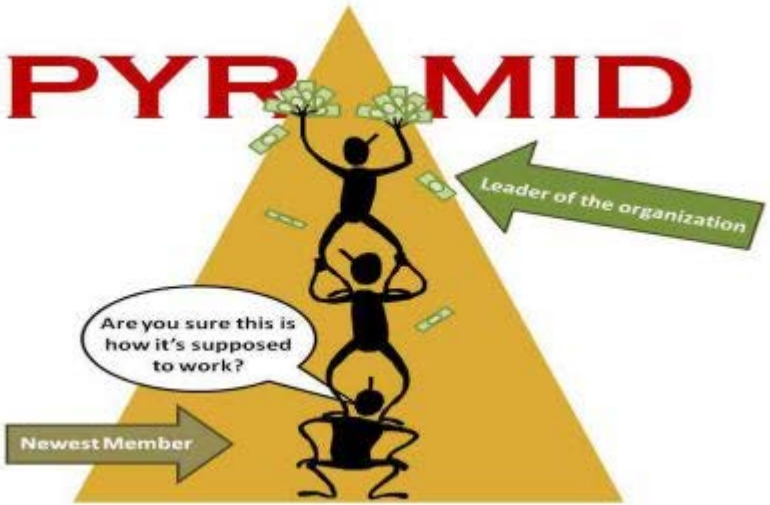

SAY BLOCKCHAIN
ONE MORE TIME
memegenerator.net

Let’s Start What Blockchain Is NOT

Bitcoin is **NOT** Blockchain

Cryptocurrencies

- There are close to 3,000 cryptocurrencies
- To date, none are pegged to an established (fiat) currency - no way to settle transactions
- Considered by many to be the new Ponzi scheme



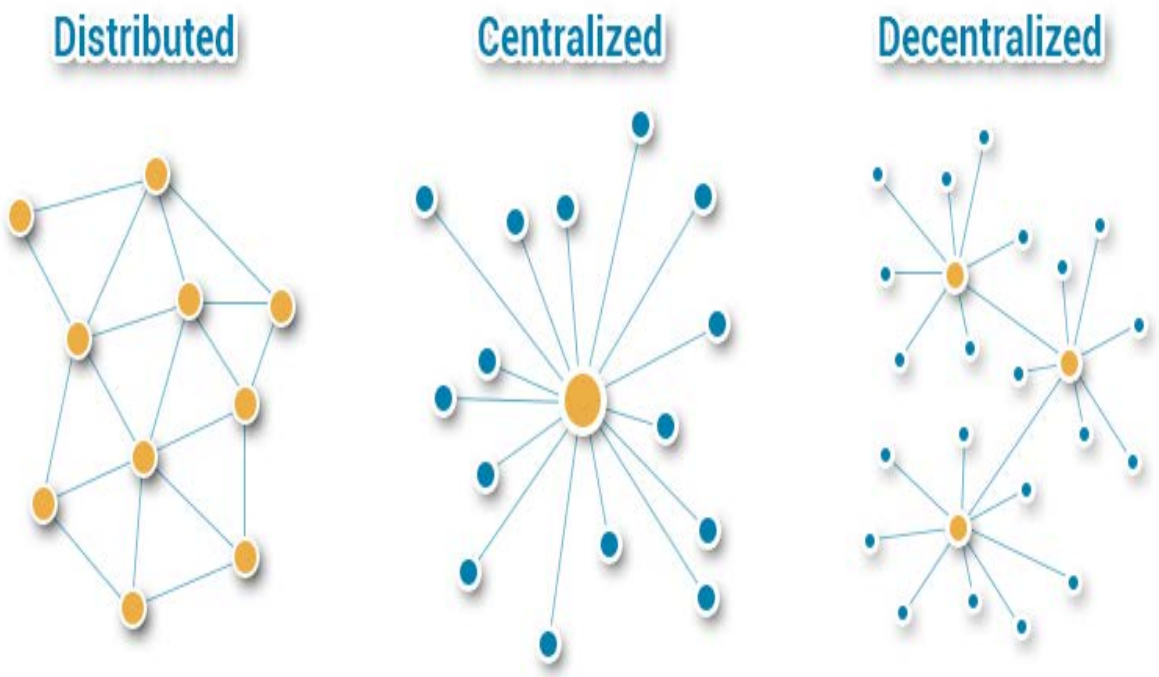
Cryptocurrency Failures 2017

- 902 crowdsale (ICO) based
- 46% failed
  - 142 - not enough funding
  - 276 - faded away or scams
- An additional 113 have stopped communicating or too few adopters

What is Blockchain?

A decentralized and distributed digital ledger to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the collusion of the network.

Distributed & Decentralized



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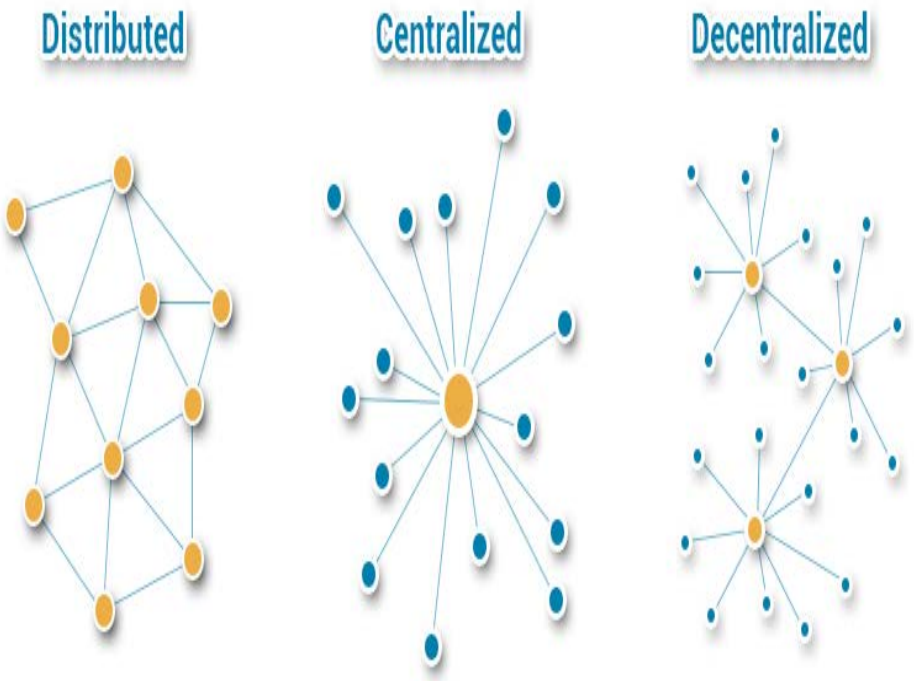
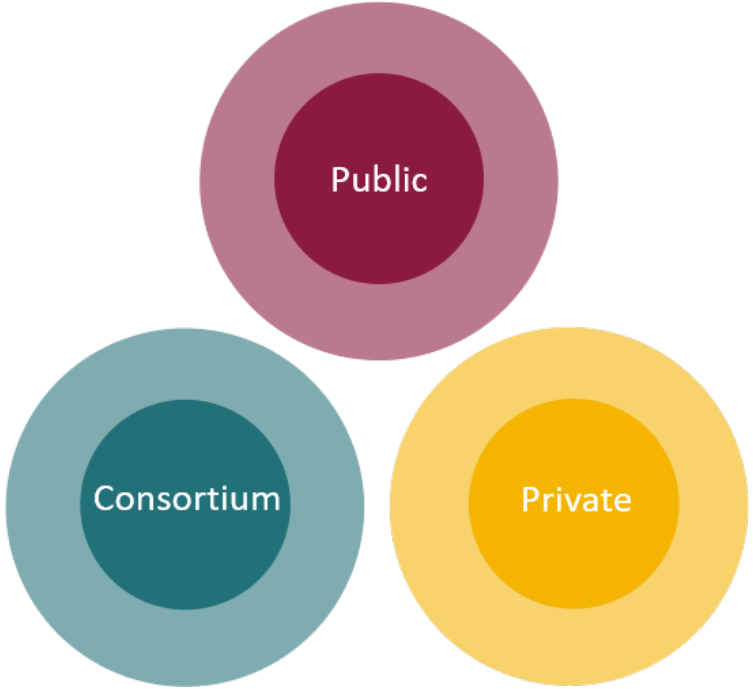


Types of Blockchains

Permissionless



Partially Permissioned

Permissioned

The Anatomy of a Block

Blockchain is the “DNA of data”

- Very difficult to alter or fake
- Lineage / History Tracking
- New info (children) retain a link to history
- Many copies make information resilient to single cell failures or attacks.
- Built-in code executes instructions across copies

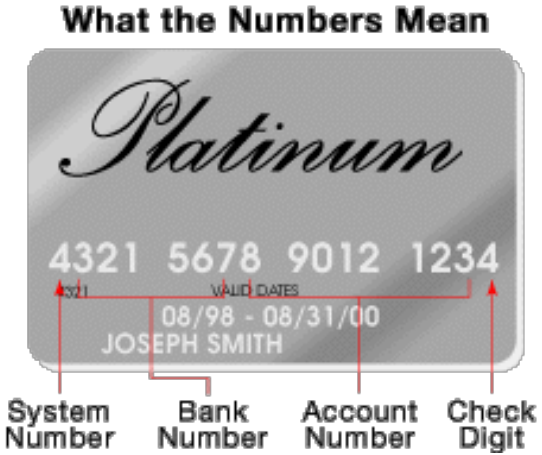
How is Blockchain a Better System?

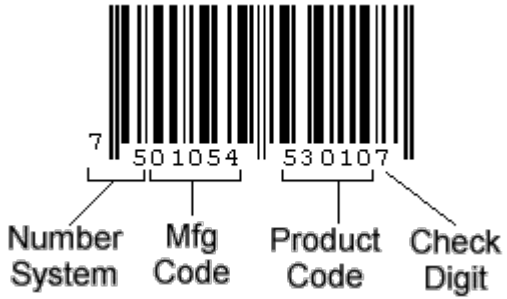
For most transactions across industries, each participant currently records their own version of the truth. Blockchain creates a shared truth.

With multiple records of the same information across systems, the data is vulnerable to error, fraud and inefficiencies. Frequently, businesses rely on intermediaries and internal processes to mitigate these risks.

With blockchain, transactions agreed by consensus are added to a block, a unique cryptographic code is calculated of the block, and that code is added to the following block creating a unique chain of blocks containing all the transactions.

Why is Blockchain Difficult to Alter/Fake?





10 Possible Check-Digit Values
10% Chance of a Random Number Having Same Check Digit

Blockchain uses “hashes” to secure information (fancy nerd-word for a check digit)

Block

Data	Hash
Previous: NULL	
Shipper: ACME Widgets	F42AFEE086053532A7
Carrier: Drive-By Truckers	99F1C5290D358CD48
Origin: Chicago, IL	9BB9D7B5CE442DE08
Destination: Dallas, TX	2E0663ED943D
Rate: $1.75 / mile	

Block

Data	Hash
Previous: NULL	
Shipper: ACME Widgets	A2F6E0F92981D1FA1205
Carrier: Drive-By Truckers	ED1A21DBCDEAFCF89C3
Origin: Chicago, IL	6D9A58D431790197B45
Destination: Dallas, TX	CF0C26
Rate: $1.74 / mile	

2^{256} Possible Hash Values

$$2^{256} = 115792089237316195423570985008687907853269984665640564039457584007913129639936$$

How Does Blockchain Secure & Track Lineage?

Each Block Contains the Hash of the Previous Block, Creating a Chain of Blocks

Data	Hash
Previous: NULL	
Shipper: ACME Widgets	F42AFEE086053532A7
Carrier: Drive-By Truckers	99F1C5290D358CD48
Origin: Chicago, IL	9BB9D7B5CE442DE08
Destination: Dallas, TX	2E0663ED943D
Rate: $1.75 / mile	

Data	Hash
Previous Hash: F42AFEE08605…	
Pickup Addr: 123 S Wacker Dr	9EDFA561669FC0380B5
Chicago, IL	EFC4F86CAAADEA29742
Pickup Appt: 4/1/18 - 10am	82954D3BCB9DAE23306
Driver ID: 8675309	FD0A685
Detention: $75 / hr after 90 min	

Data	Hash
Previous: NULL	
Shipper: ACME Widgets	A2F6E0F92981D1FA12
Carrier: Drive-By Truckers	05ED1A21DBCDEAFCF
Origin: Chicago, IL	89C36D9A58D431790
Destination: Dallas, TX	197B45CF0C26
Rate: $1.74 / mile	

Data	Hash
Previous Hash: F42AFEE08605…	
Pickup Addr: 123 S Wacker Dr	9EDFA561669FC0380B5
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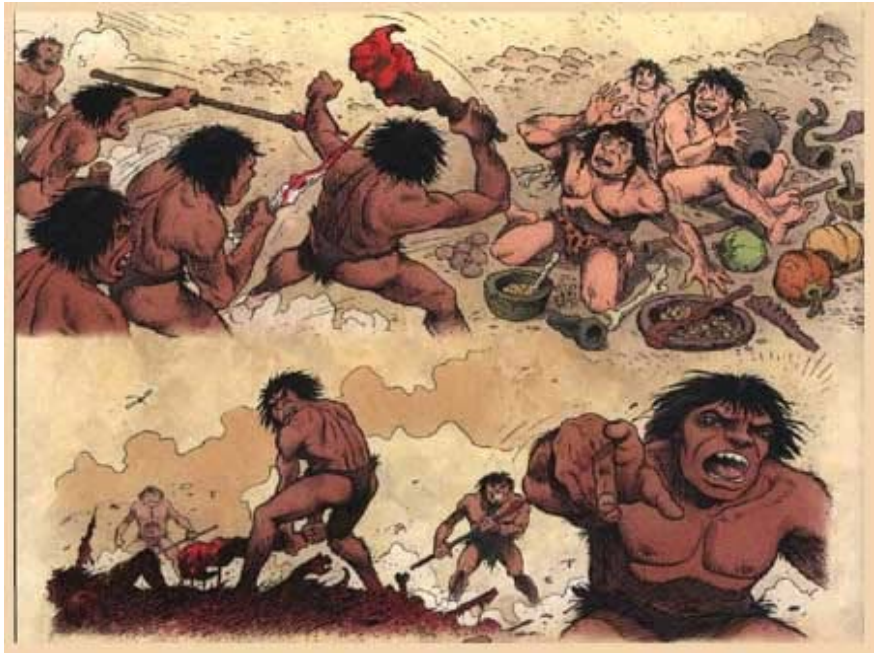
Changing Historical Records Breaks the Chain, and is Easily Detected

Smart Contracts

Evolution of Contracts

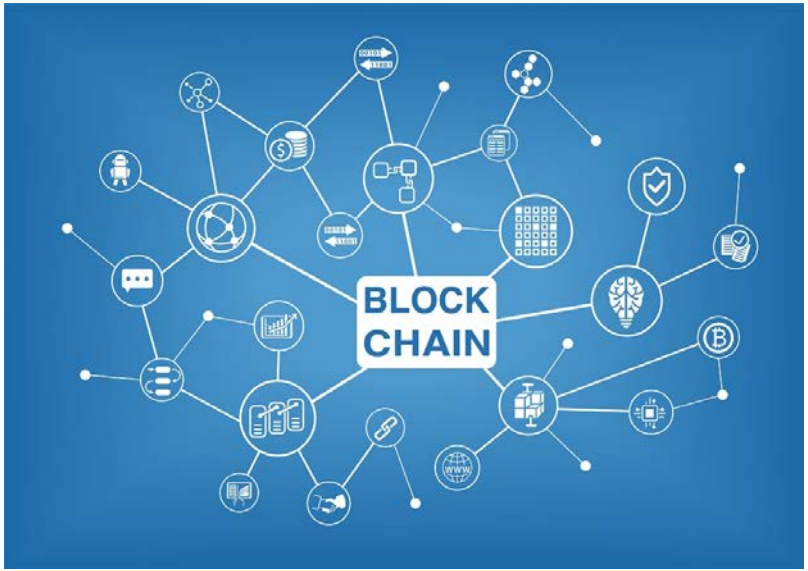


Agreements Enforced by Strongest Tribe

Evolution of Contracts

Agreements Enforced by Institutions

Evolution of Contracts

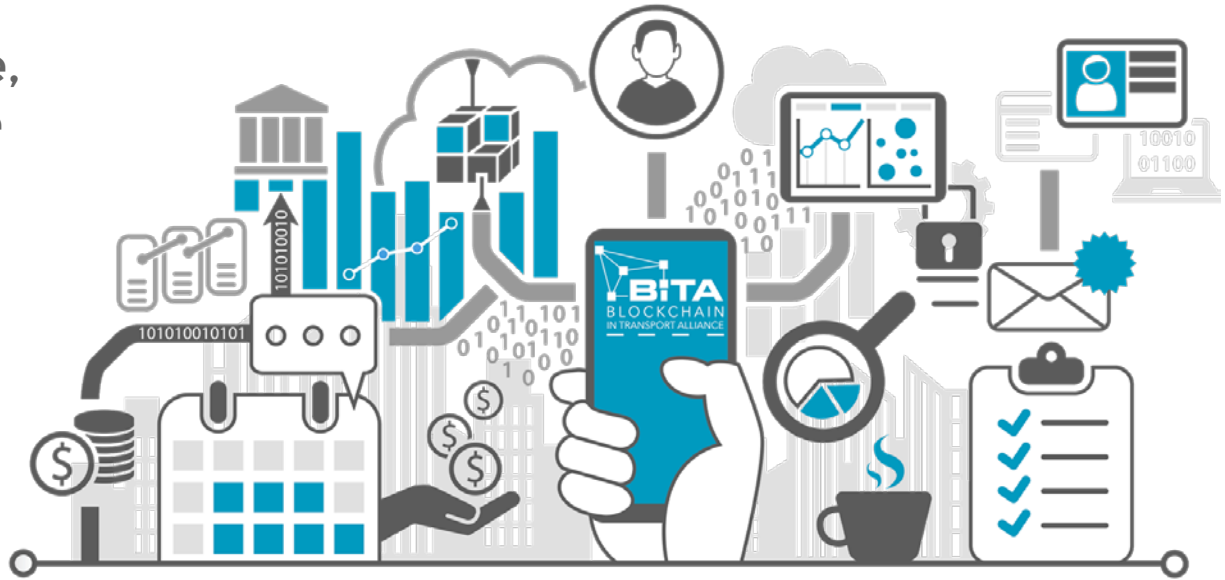


Agreements Enforced by Smart Contracts

Smart Contracts

Computer code, attached to a blockchain transaction, which is executed under predetermined conditions.

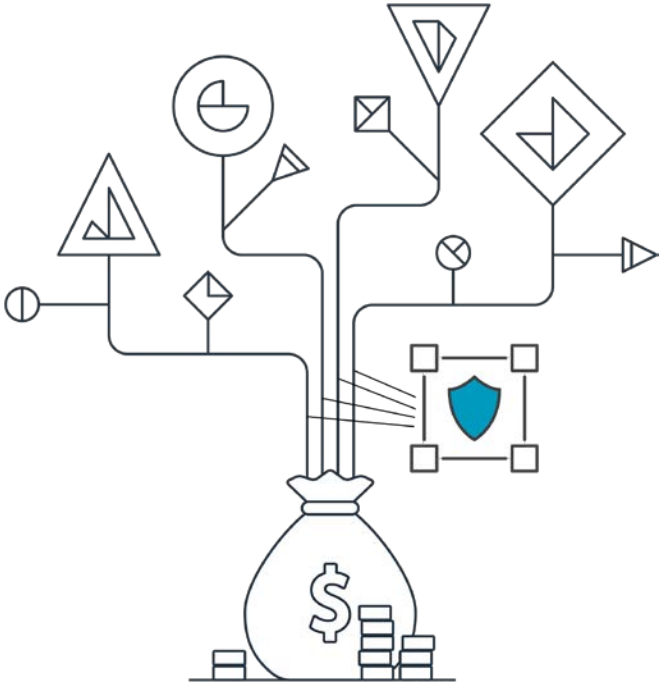
Intended to facilitate, verify, or enforce the negotiation or performance of a contract.



Opportunities & Challenges

Opportunities

- Free up capital
- Lower transaction costs
- Speed up processes
- Provide security and trust



Challenges

- Scalability
  - Public blockchains are currently limited to 3-20 transactions per second. Visa is capable of approx 56,000 tps.
- Data Privacy
  - By definition, all data is held by all participants, careful protocols have to be agreed to encrypt commercially sensitive data in any ecosystem.
- Collaboration
  - Many applications of blockchain require agreement of protocols within industries.
- Commercialization
  - Blockchain applications code are generally open source and can be utilised anonymously, so IP is difficult to protect.

Introduction to Use Cases

Do You Even Need Blockchain?

- Does my use case involve a database?
- Will there be numerous users updating my database?
- Do these users need to trust each other?
- Are there problems caused by the use of a central/third party entity?
- Do transactions depend on/interact with each other?

If the answers to these questions are yes, this might be a solid use case.

Use Cases

Performance History

Performance history through the blockchain framework can 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 allows for item by item records of vehicle repairs. Instead of one person holding an extensive repair history, it is held within the blockchain. The history can now effectively move with the equipment for anyone to see.

Quality Assurance

Thanks to the distributed nature of blockchain, everyone involved in the transaction has access to all points. Taking photos and evaluating freight at pick-up and delivery locations reduces the likelihood of unsubstantiated disputes.

Use Cases

Compliance

Blockchain and ELDs are a natural pair. ELDs can send a near endless stream of data to the blockchain in real-time. Pairing this information with traffic data, weather data, etc. allows for up to the minute rerouting.

Capacity Monitoring

In trucking, available capacity can change throughout the day. The blockchain can provide the necessary transparency to know when and where capacity opens up, allowing participants to take advantage of shifts in demand.

Use Cases

Payments and Pricing

Payment processing and settlement is all secure on the blockchain, and transaction information is easily accessible. By keeping detailed historic payment records, people can use more data than ever to determine rates. Provides quicker, cheaper payments.

Fraud Detection

Every transaction that takes place on the blockchain is visible to everyone on the network, and nothing can be removed. This transparency removes many points where fraud occurs and eliminates double brokering.

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.

Use Cases

Driver ID/Passport

Telematics data provides a wealth of information even the ability to track driver performance. This date could allow a driver with a solid history to command a premium in pay. Companies could be armed with data to make better hiring decisions and reduce recruitment & retention costs.

IoT

IoT and blockchain are a great match. Examples could include odometer records, parts warranties, vehicle servicing, drive cameras, etc. Any connected data can be utilized.

Cold Chain

Blockchain would provide greater transparency by providing all participants the ability to provide proof of trailer/food temperature, food security, etc. This would help eliminate disputes and rejected loads.

Use Cases

BLOCKCHAIN

FUEL PAYMENTS AND REPRICING WITHOUT THE NEED FOR A PROCESSOR

RECORDING RFPs AND TRANSACTIONS

Immutable record of agreed economics

INTERNET OF THINGS

Odometer recordings, parts warranties & vehicle servicing

PAYMENT AND SETTLEMENT SOLUTIONS

Quicker, cheaper payments

EDI COMMUNICATIONS

Use Cases II

Self executing Smart Load Contracts

Contracts executed and arbitrated using blockchain, lowering risk and costs for both carriers and shippers.

Proof of Provenance

(chain of custody/bread crumbs)

Verifiable provenance with long supply chains.

Proof of Delivery

Recorded on blockchain, available to relevant parties.

End to End Implementation Snapshot

CARRIER

The carriers and OEMs have connected the trucks into a permissioned blockchain network.

The carrier solicits freight from 3PLs and shippers connected to the blockchain network.

3PLs

SHIPPERS

Once the carrier has an available truck, the network matches up a shipper load based on the ELD telling the network how many hours are available for the driver.

A reference price is used to determine how much the shipper will pay for the load.

A smart contract is created and transmitted to the carrier that dictates price, fuel and accessorials.

The carrier agrees to the terms.

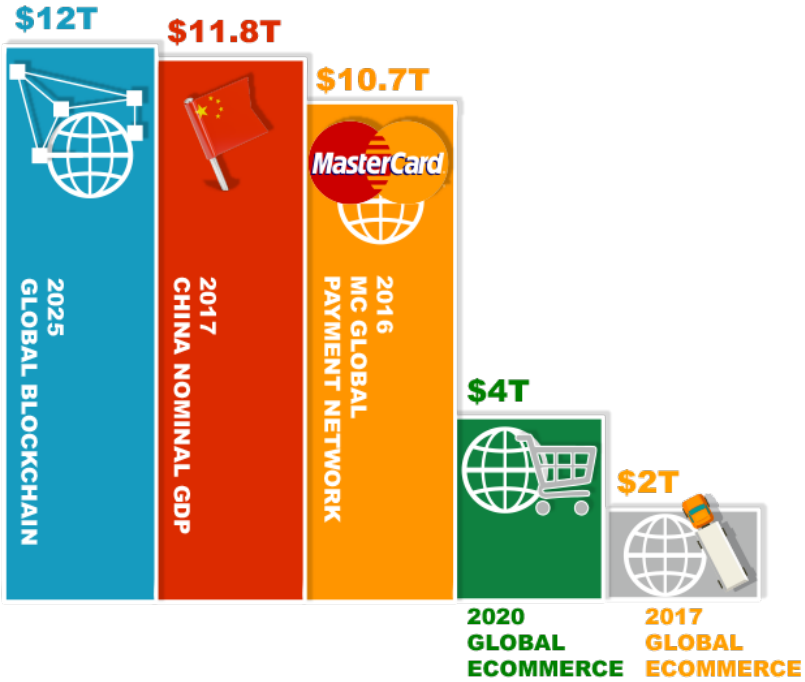
The contract is executed and truck is dispatched.

The load events are transmitted into the blockchain, giving the shipper full visibility of the load throughout the transaction, along with the history of the carrier and potentially the driver.

Once the load has been completed, a proof-of-delivery is transmitted.
An invoice is sent.
A bank pays the carrier immediately.
The carrier is done.

The Future of Blockchain

Blockchain Market Comparison



Rapid Industry Growth

In 2017, consulting firm Deloitte said that 10% of global GDP would be built on top of blockchain applications by 2025 -- approximately $12 trillion dollars.

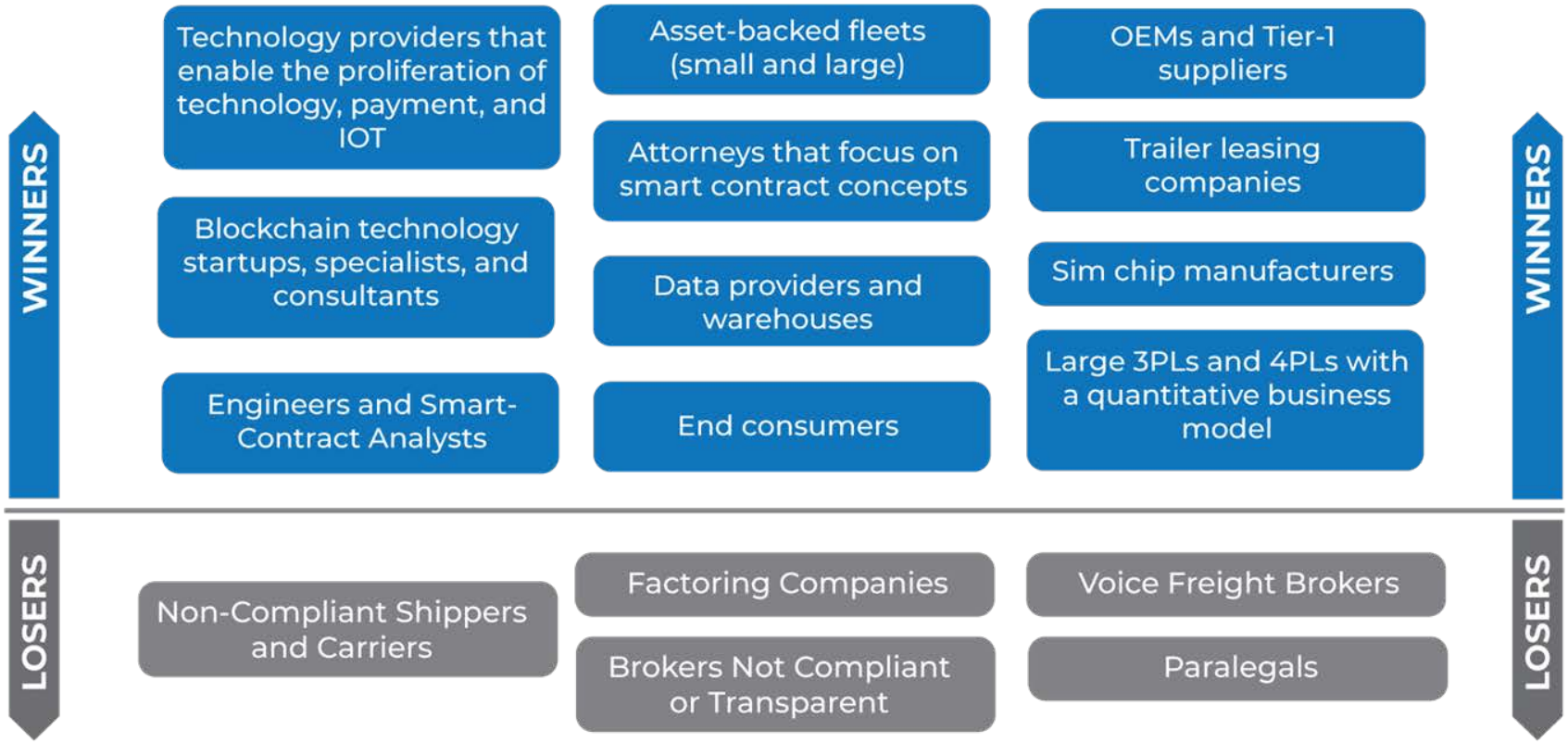
It's estimated that Blockchain in Transportation is a $750 billion dollar opportunity in the U.S. alone.

Disruptive Impact

As blockchain digitizes, decentralizes, secures and incentivizes the validation of transactions, it will fundamentally change the industry.

- Eliminates need for intermediaries
- Expedites payments and settlements
- Automates proof of delivery
- Provides immutable record of agreed economics

Winners and Losers



Adoption & Implementation Forecast

2018-2020 - Education, Case Studies, and Early Adoption

- Industry-wide education on use cases outside of crypto-currency
- Develop industry-wide standards and apply to case studies
- Early adoption within innovative startups and pilot programs at large corporations with extensive resources (ex: IBM, Daimler)
- Regulatory authorities develop auditing and compliance practices

2021-2025 - Growth

- Early adopters and standards activity provide greater clarity and minimize uncertainty, driving widespread adoption

2026 and beyond - Maturity

- Blockchain is widely adopted and considered an integral part of the supply chain ecosystem

Questions??

Thank you!

For more information visit BiTA:

www.bita.studio

Chris@bita.studio