

Blockchain

AT Board Strategy Session

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What is Blockchain?

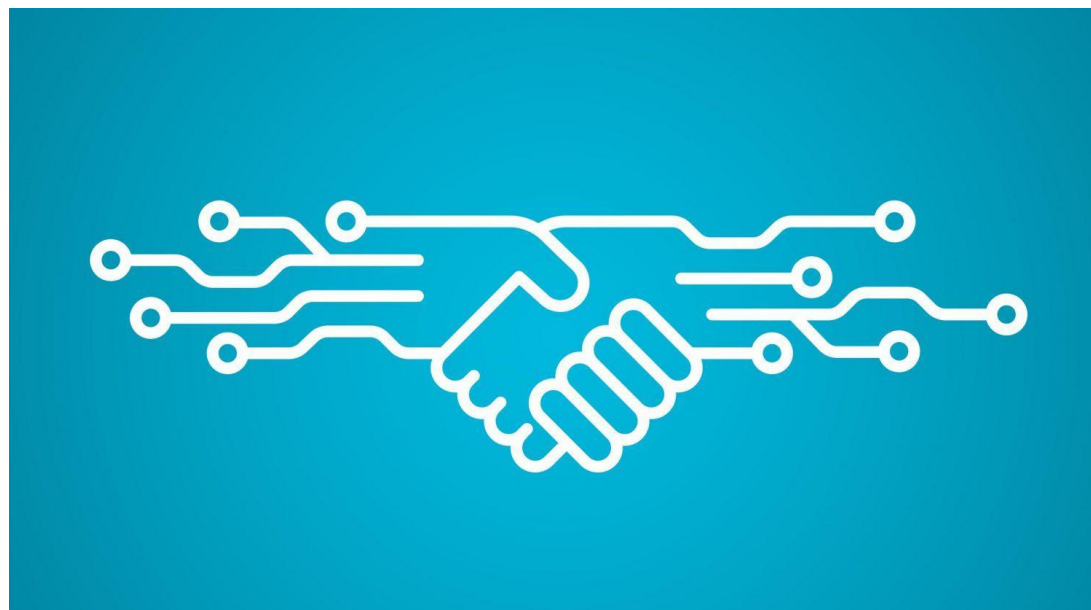
Blockchain is a technology that originated out of a branch of mathematics called cryptography.

In short, it's a decentralised, [shared digital ledger](#) that relies on the consensus of a global peer network to operate.

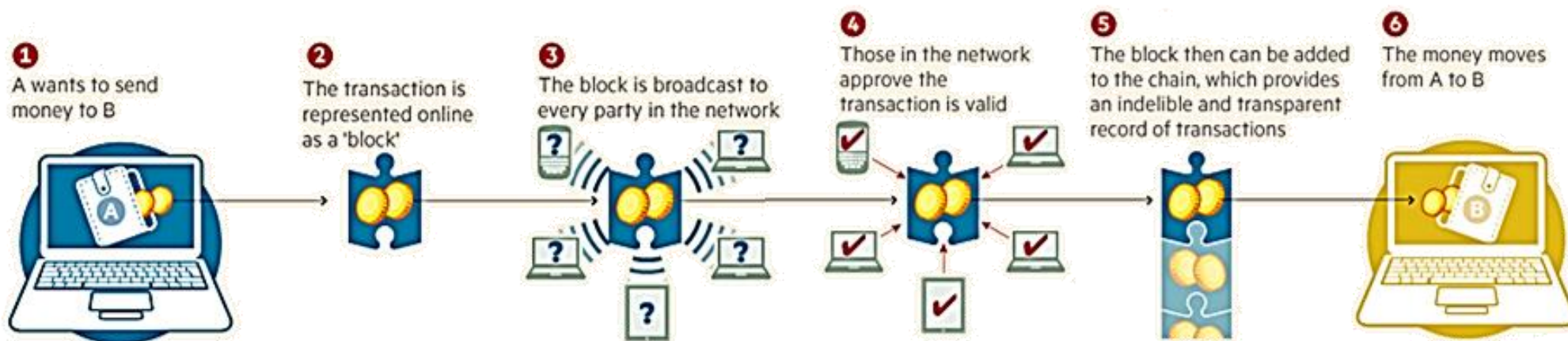
The digital ledger is essentially a series of encrypted “blocks” that are linked together in a public “chain.”

Modifying the data in one block is impossible without modifying the entire chain and receiving consensus of the entire peer network.

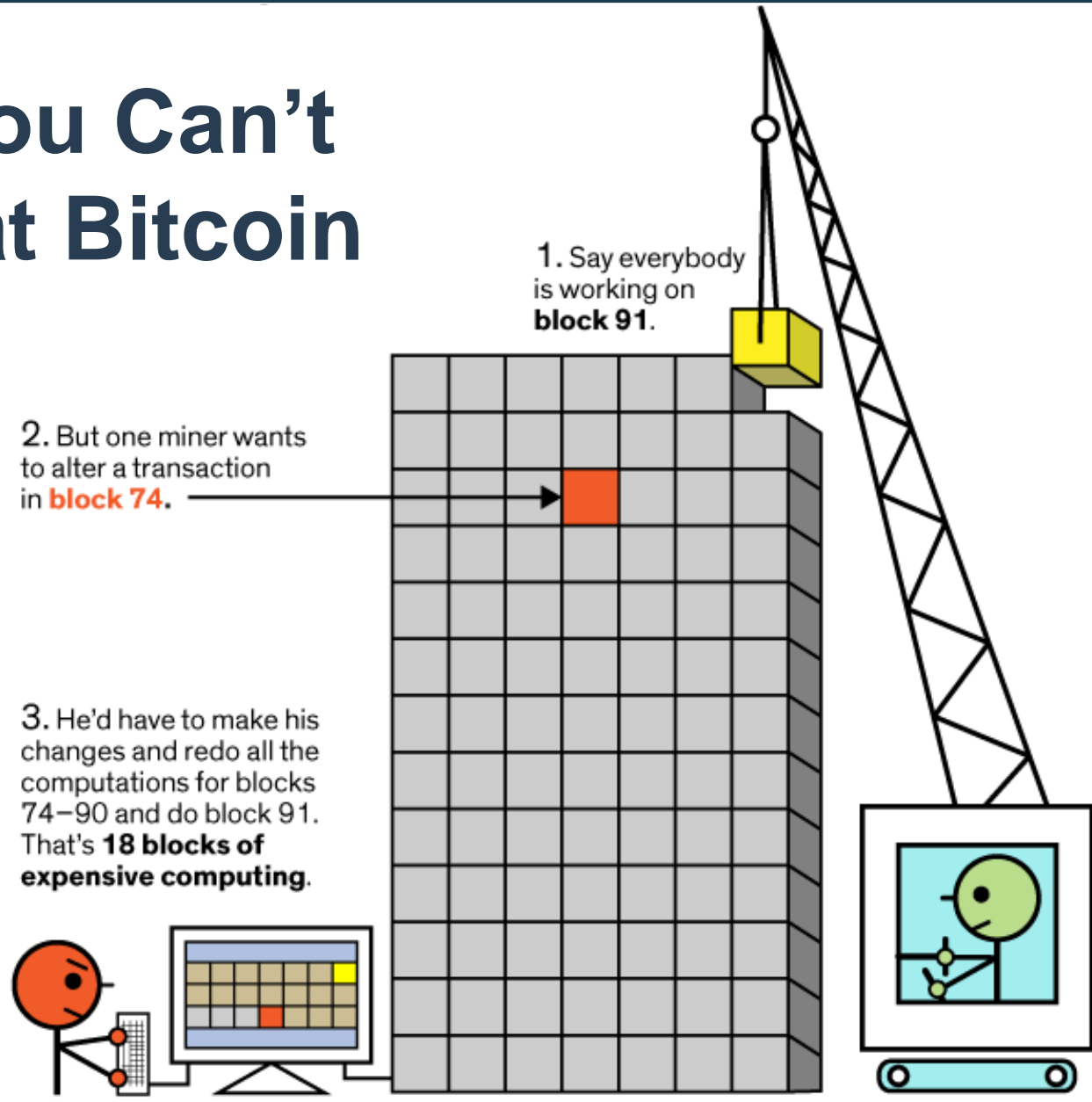
This makes it incredibly difficult to perform malicious activity or falsify data. Once it's in the blockchain, it's pretty much in there for good.



How a Blockchain Works



Why You Can't Cheat at Bitcoin



1. Say everybody is working on **block 91.**

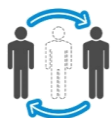
2. But one miner wants to alter a transaction in **block 74.**

3. He'd have to make his changes and redo all the computations for blocks 74-90 and do block 91. That's **18 blocks of expensive computing.**

4. What's worse, he'd have to do it all **before** everybody else in the Bitcoin network finished **just the one block (number 91)** that they're working on.



Decentralisation has great benefits and changes fundamental processes and models



Eliminates Intermediaries

Allows industries to redefine or create new business models.



Reduces Fraud

Highly secure and transparent, making it nearly impossible to change historical records.



Increases Efficiency and Speed

Simplifies transactions and enables T+Zero settlement time.



Increases Revenue and Savings

Potential savings and new revenue opportunities through more efficient processes and reduced costs.

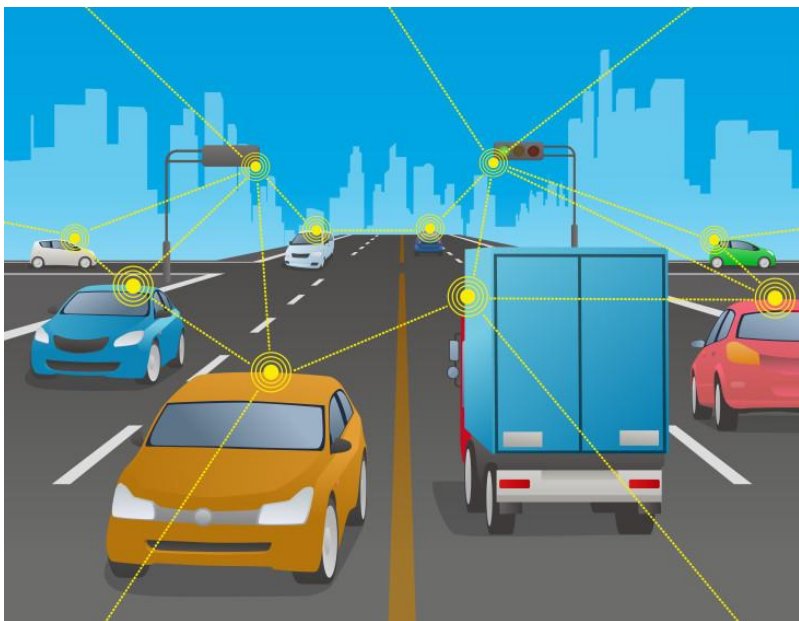
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Transport Blockchain

The Blockchain in Trucking Alliance, also known as BiTA, is the largest organisation in the space. It boasts major members from just about every corner of the trucking supply chain, from UPS to Salesforce and DAT.



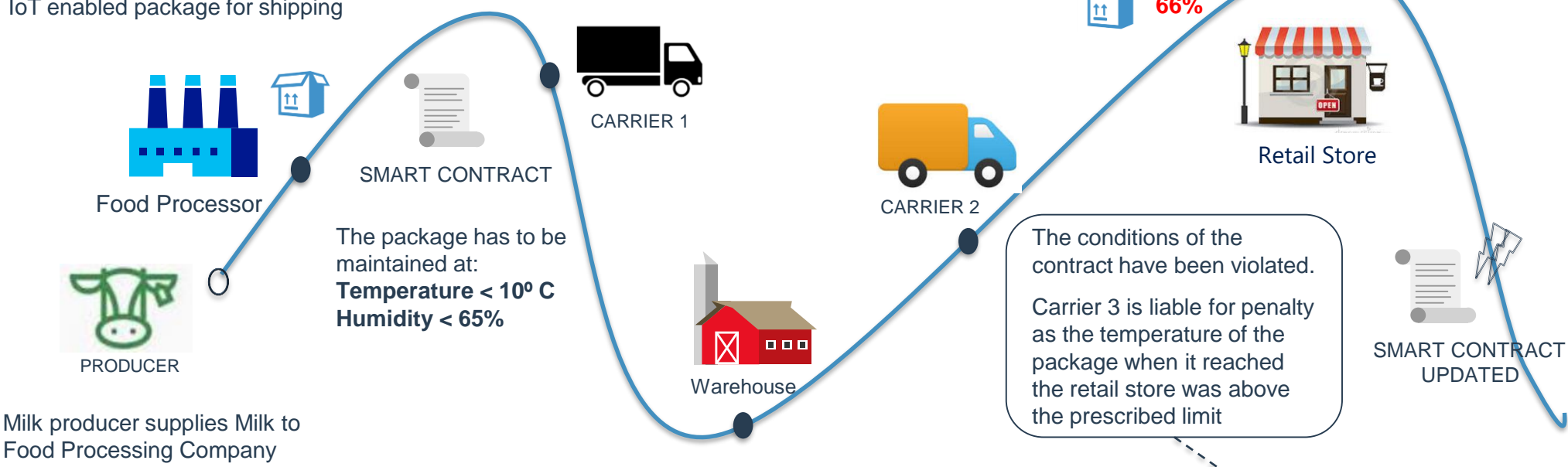
Membership in BiTA is steadily growing, with over 1,000 current applicants, but the overall influence of existing members is already massive. In fact, BiTA members account for over 85% of trucking-related transactions in the world.

<https://www.winnesota.com/blockchain>

Freight Transportation

The milk product is sealed in an IoT enabled package for shipping

The terms of shipping are registered using a **smart contract** on the Blockchain



Milk producer supplies Milk to Food Processing Company

The conditions of the contract have been violated.
Carrier 3 is liable for penalty as the temperature of the package when it reached the retail store was above the prescribed limit

At various points in the journey, the IoT device from the package sends the Temperature & Humidity data which are recorded on the blockchain



SHARED LEDGER			
Origin	8°C 60%	Warehouse	9°C 64%
Carrier 2	9°C 64%	Store	11°C 66%



Transport Opportunity with Blockchain

- **LTL Inefficiency**
- 90 percent of trucking companies worldwide have six trucks or fewer. This causes the industry to struggle with matching shippers (the demand) with carriers (the supply).
- Due to this issue, it's estimated that truckers drive 29 billion miles per year with partial or empty truckloads. In case you were curious, that's equivalent to just over a million trips around the full circumference of the earth.
- This inefficiency in consolidating LTL loads costs trucking companies millions of dollars every year. It also raises shipping costs for consumers.
- Blockchain enables better matching and less empty loads.

Public Transport Opportunities

1 Input: Utilised Services

Charging

Toll collection / road fees

Parking

Leasing

Insurance

...

2 Processing: Vehicle Services

eWallet in the vehicle

Algorithms (e.g. choice of service provider)

Data feeds, Data aggregation, data logging

Connectivity

Accounting, P/L Statement

...

3 Output: Offered Services

Ride hauling / ride sharing

Transport of goods

Data gathering / aggregation services

Parcel dropping point

Mobile battery (bidirectional V2G)

...

Transactive Mobility Service Platform

Consortium Blockchain with (almost) zero marginal transaction fees

Auckland Transport

Uses

- Mobility as a Service
 - Bookings and Payments for first and last leg
 - Ticketing services
 - Parking and other road enforcement fines
 - Video surveillance and Red Light running evidential accuracy
 - Other ideas...?

Options

1. Early adopter
2. Wait and see
3. Let NZTA lead
4. Look to partner with others