Global Knowledge®

Blockchain 101

Overview and Use Cases

Presented by Kris Bennett

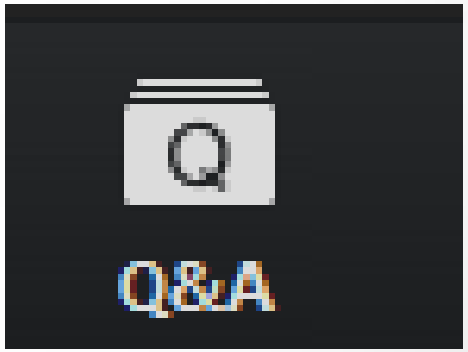
Building Skills to Enable Success

Attendee Information

Open and hide your control panel with orange arrow

Join audio

- Mic & Speakers to use VoIP
- Telephone and dial in using the info provided



Note: Today's webinar is being recorded.

Kris Bennett – Chief Learning Officer, BTA

Who am I?

- Kris Bennett, #BlockchainBeardGuy
- Chief Learning Officer, Blockchain Training Alliance

What is Blockchain Training Alliance?

- Blockchain Training and Certification
  - Partnered with Pearson VUE testing centers
  - Exclusive Blockchain content provider
- Workshops and Consulting Services
  - Help making your ideas a reality

Kris Bennett

BLOCKCHAIN TRAINING ALLIANCE

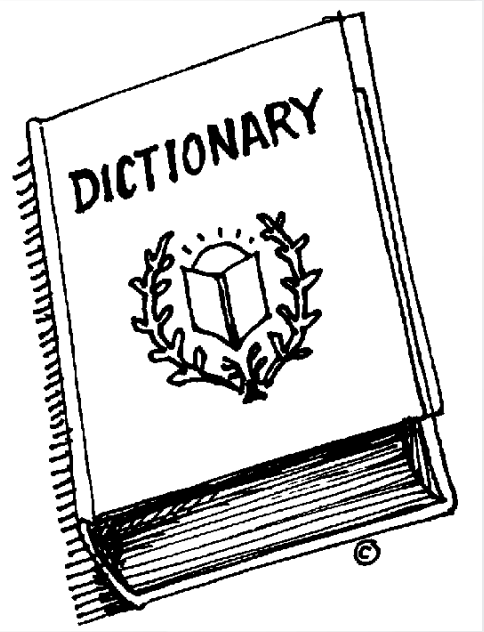
Blockchain 101

Overview and Use Cases

Intro to Blockchain Architecture

Blockchain Basic Terms

- Immutable
  - Cannot be changed, edited, or deleted. Permanent record.
- Append-Only
  - A system in which data can only be read or added. No deletes or edits are possible.
- Ledger
  - A log or historical record of events for a particular item.
- Consensus
  - The truth is assumed to be whatever the majority of participants believe it to be.



What is Blockchain?

- An immutable, append-only ledger.
- Multiple copies of this ledger are stored on nodes (computers) across a network.
- Nodes attempt to reach consensus on the contents of the ledger.

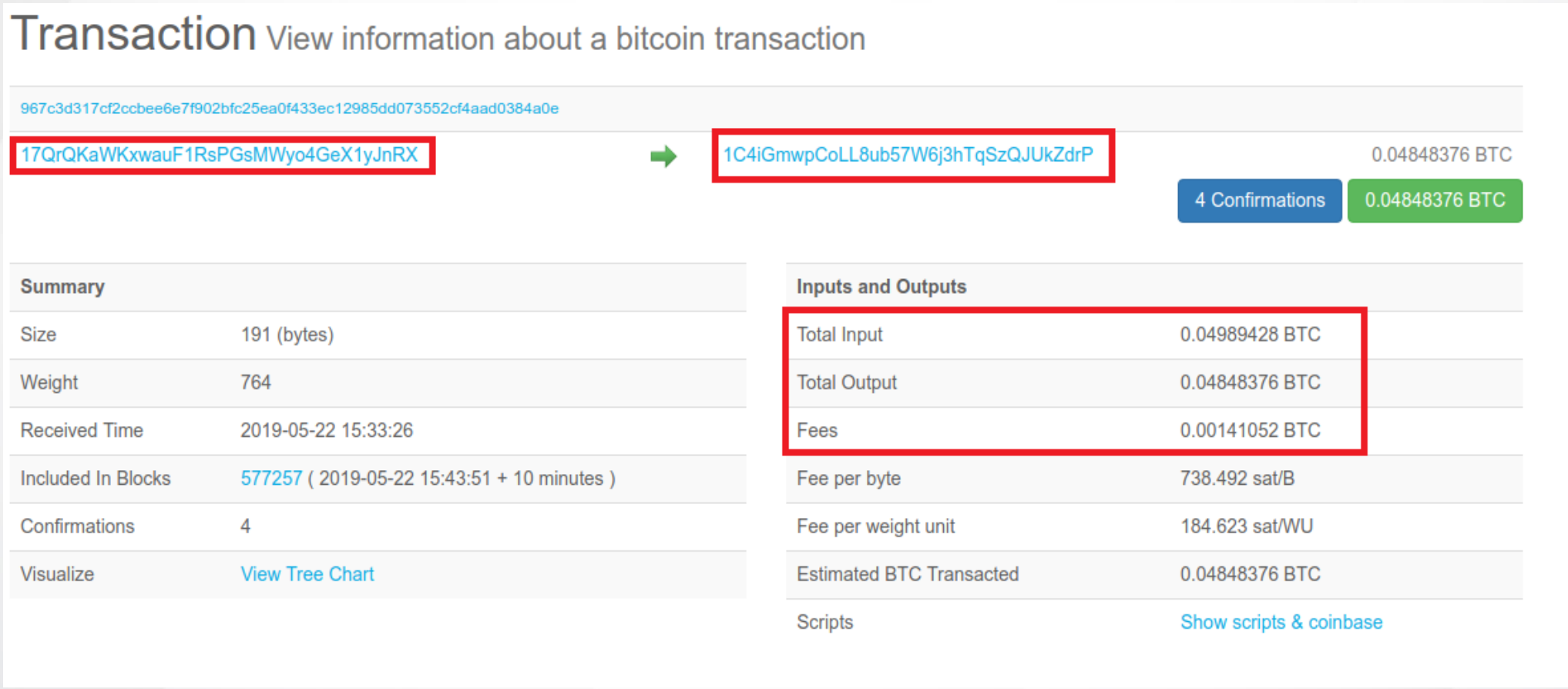
Intro to Blockchain Architecture

History of Blockchain

- Bitcoin – 2009
  - Ledger used to track the history of one asset – Bitcoin
  - Single, shared ledger
  - Blockchain 1.0 – Just a ledger, nothing more…
  - Anonymous and fully-transparent
  - Primary Focus: A ledger to enable and facilitate digital payments

Intro to Blockchain Architecture

A Bitcoin Transaction



Transaction View information about a bitcoin transaction

967c3d317cf2ccbee6e7f902bfc25ea0f433ec12985dd073552cf4aad0384a0e

17QrQKaWKxwauF1RsPGsMWyo4GeX1yJnRX → 1C4iGmwpCoLL8ub57W6j3hTqSzQJUkZdrP 0.04848376 BTC

4 Confirmations 0.04848376 BTC

Summary	
Size	191 (bytes)
Weight	764
Received Time	2019-05-22 15:33:26
Included In Blocks	577257 (2019-05-22 15:43:51 + 10 minutes)
Confirmations	4
Visualize	View Tree Chart

Inputs and Outputs	
Total Input	0.04989428 BTC
Total Output	0.04848376 BTC
Fees	0.00141052 BTC
Fee per byte	738.492 sat/B
Fee per weight unit	184.623 sat/WU
Estimated BTC Transacted	0.04848376 BTC
Scripts	Show scripts & coinbase

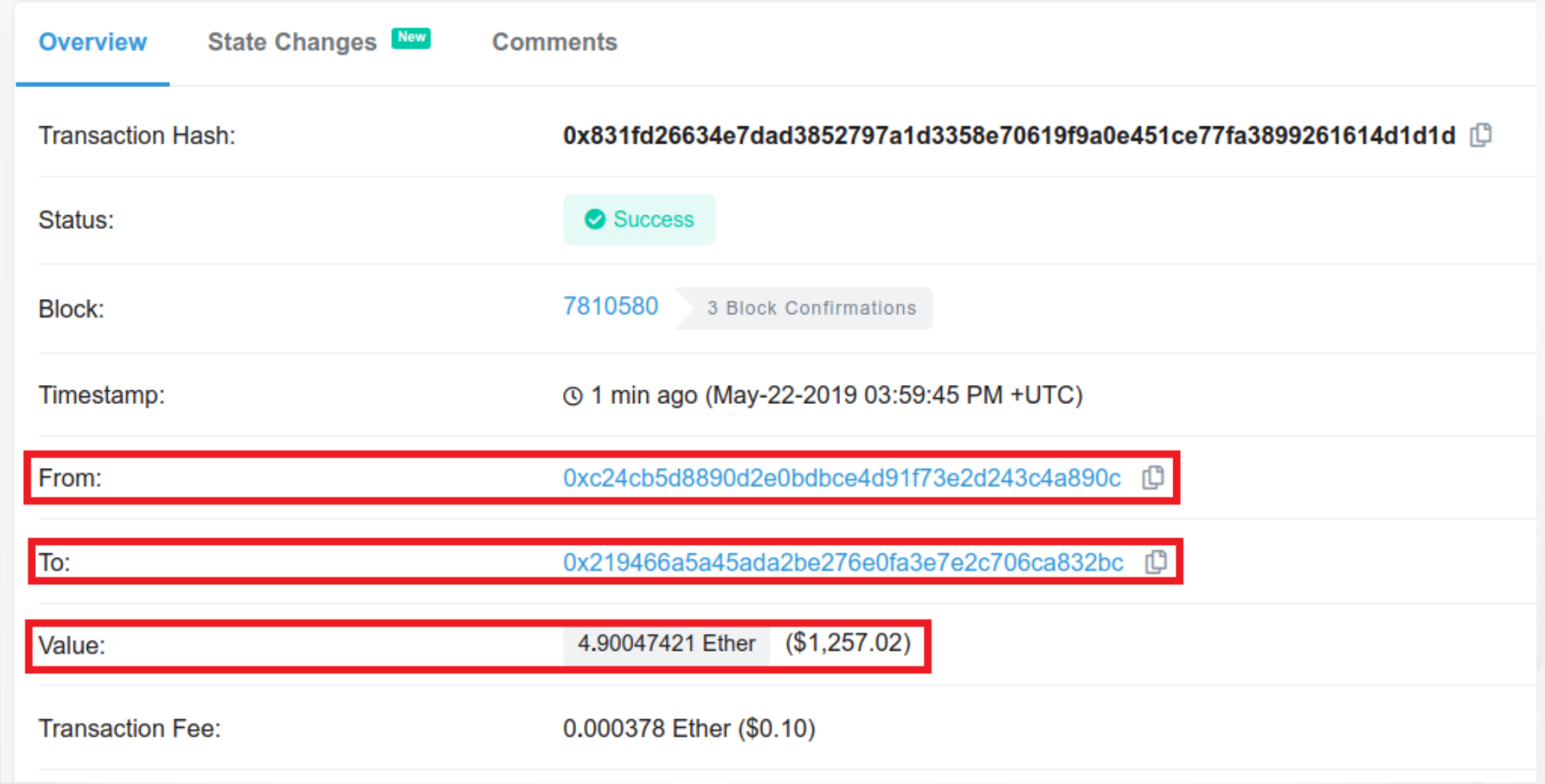
Intro to Blockchain Architecture

History of Blockchain

- Ethereum – July 2015
  - Ledger used to track the history of Ether
  - Ledger can also be used to track ANY other asset, not just Ether!
  - Single, shared ledger
  - Blockchain 2.0 - Smart Contracts and the EVM
    - Program your own logic for how events should be handled
    - Blockchain as a workflow / BPM solution
  - ERC20 token standard
    - Standard architecture for tokenizing any type of asset
  - Anonymous and fully-transparent
  - Primary Focus: A platform to build consumer applications on

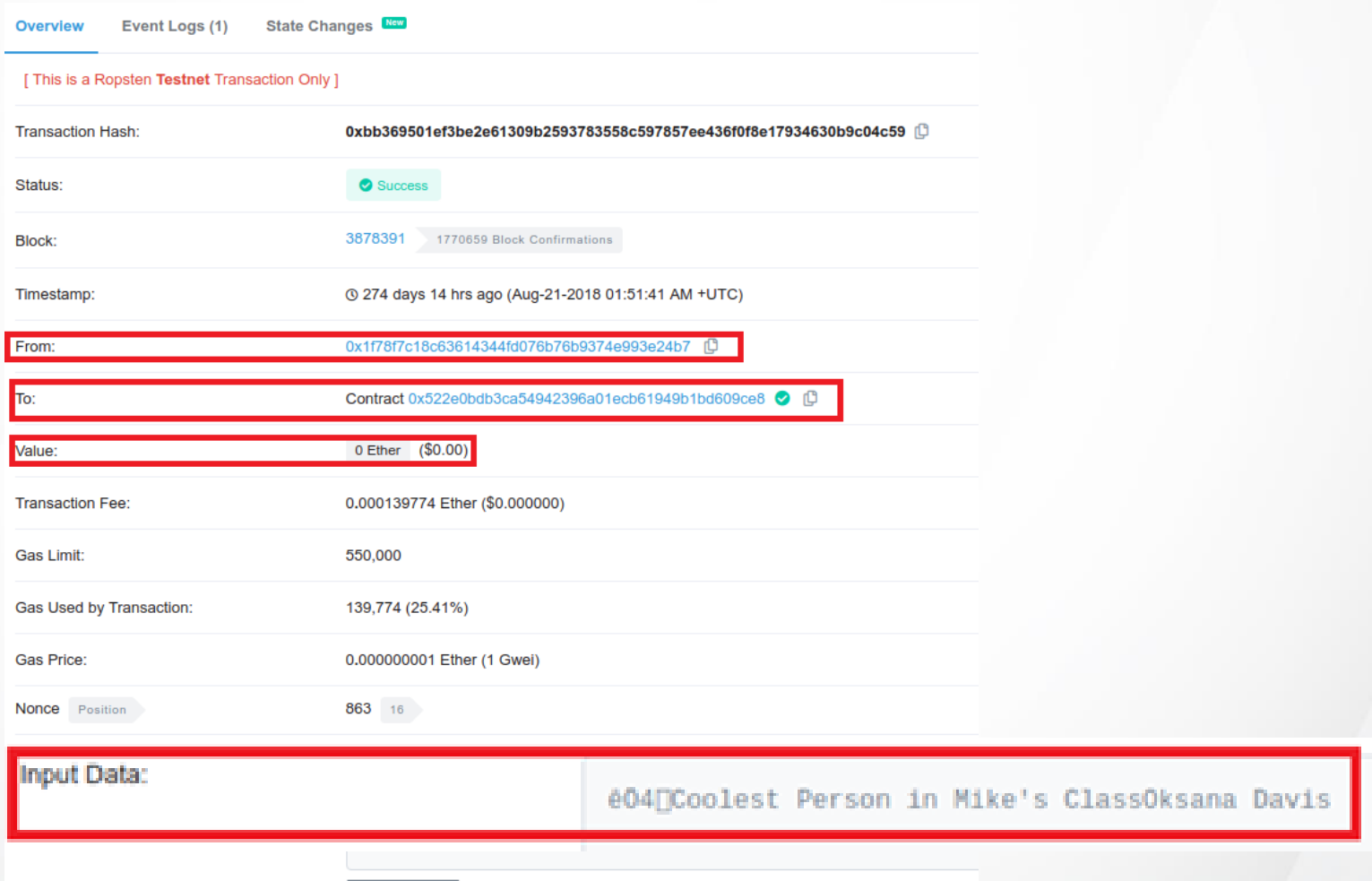
Intro to Blockchain Architecture

A Financial Ethereum Transaction



Intro to Blockchain Architecture

A Non-Financial Ethereum Transaction



Intro to Blockchain Architecture

History of Blockchain

- Hyperledger – December 2015
  - No native token model (yet)
  - Ledger can be used to track any kind of asset
  - Multiple ledgers
  - Blockchain 2.0 – Chaincode (aka Smart Contracts)
  - Identity and Permissioning
  - Primary Focus: A platform for building cross-organizational enterprise applications on

Intro to Blockchain Architecture

A Hyperledger Fabric (Composer) Transaction

```
{
 "$class": "org.hyperledger.composer.system.AddParticipant",
 "resources": [
  {
   "$class": "org.acme.vehicle.auction.Member",
   "balance": 0,
   "email": "alice@abc.com",
   "firstName": "Alice",
   "lastName": "Johnson"
  }
 ],
 "targetRegistry": "resource:org.hyperledger.composer.system.ParticipantR
 "transactionId": "f01890fd-8b01-49b3-adf9-1b3533119ecf",
 "timestamp": "2019-05-22T17:39:52.673Z"
}
```

Enterprise Blockchain

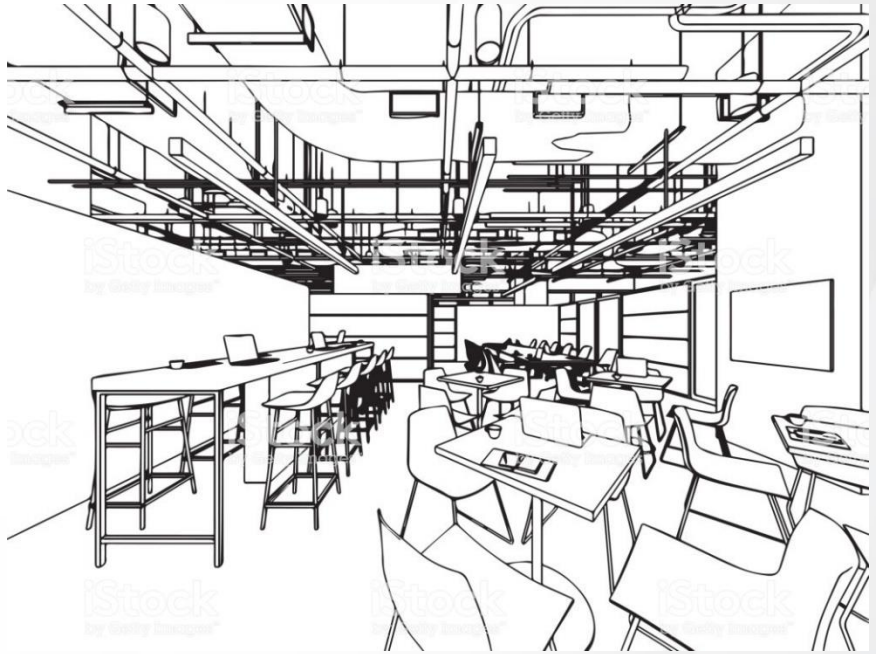
Properties of a Blockchain (public, open, permissionless):

- Decentralized ledger
  - Can store any type of data
  - Shared ledger
- Immutable
- Anonymous
- Fully-Transparent
- Group Consensus
  - Nodes only verify data was recorded correctly
  - No ability to verify truth of the data itself
- Smart Contracts
  - Ability to automate processes
  - Blockchain as workflow / BPM

Enterprise Blockchain

Properties of an ***enterprise blockchain?***

- Decentralized ledger
  - Can store any type of data
  - Shared ledger
- Immutable
- Anonymous
- Fully-Transparent
- Group Consensus
  - Nodes only verify data was recorded correctly
  - No ability to verify truth of the data itself
- Smart Contracts
  - Ability to automate processes
  - Blockchain as workflow / BPM



Do I have a good use case?

How Do You Answer These 4 Questions? (y/n)

1. Do I have one or more assets I want to track?
2. Do I care about the evolution / lifecycle of an asset?
3. Is the evolution / lifecycle of an asset governed by rules and well-defined processes?
4. Am I the single voice of truth for questions about an asset?

Do I have a good use case?

A Good (potential) Blockchain Use Case:

1. Do I have one or more assets I want to track?

– **YES**

2. Do I care about the evolution / lifecycle of an asset?

– **YES**

3. Is the evolution / lifecycle of an asset governed by rules and well-defined processes?

– **YES**

4. Am I the single voice of truth for questions about an asset?

– **NO**

Do I have a good use case?

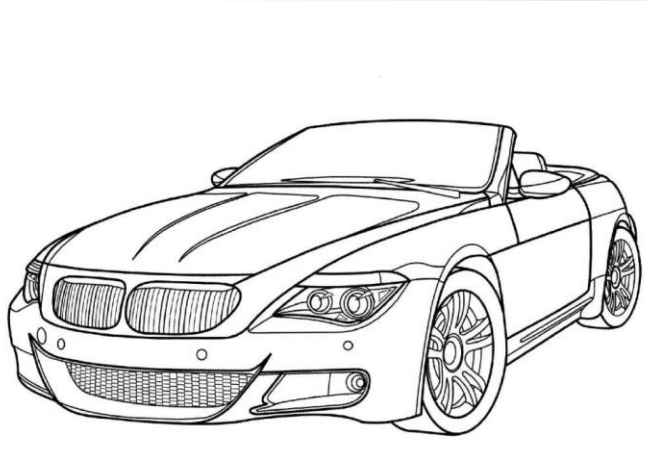
Let’s Review:

1. Do I have one or more assets I want to track?

– *There's something I care about that I want to track. This thing can be physical or virtual. Bitcoin, digital music, food products, intellectual property, and usage of a service platform are all valid examples of an asset.*

– If **YES**, a shared immutable ledger of events affecting the assets you care about is likely of value.

– If **NO**, you're likely trying to solve a business problem better suited to tools other than blockchain.



Do I have a good use case?

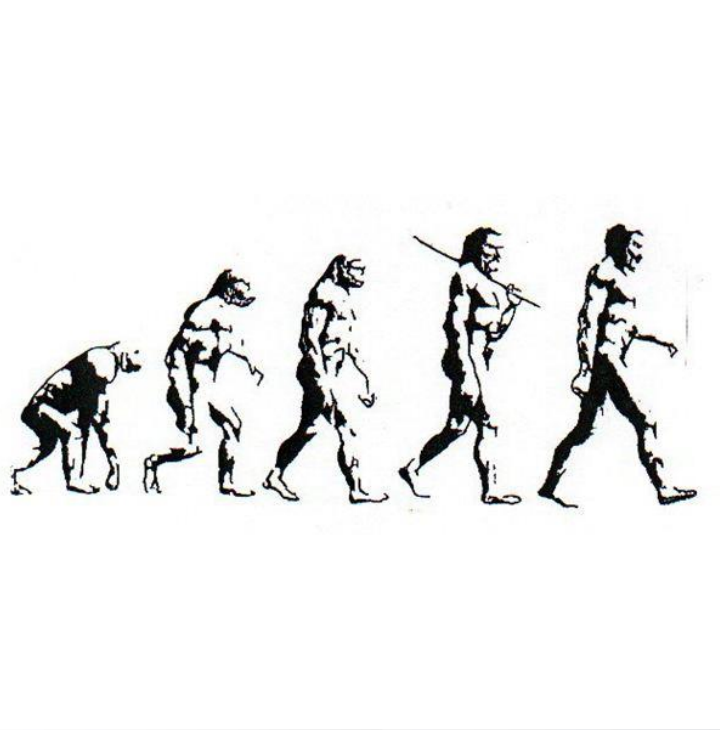
Let's Review:

2. Do I care about the evolution / lifecycle of an asset?

– *It is not enough for me to know the current state of an asset; it is important for me to be able to see the history of an asset and how it has evolved over time.*

– If **YES**, the permanent append-only ledger providing full version history of all assets and their related properties will likely be of significant value.

– If **NO**, a database is likely a suitable data storage component.



Do I have a good use case?

Let's Review:

3. Is the evolution / lifecycle of an asset governed by rules and well-defined processes?

– *An asset in my business evolves over time according to rules and well-defined processes.*

– If **YES**, Smart Contracts and the ability to automate business processes according to clearly defined rules will likely add significant value.

– If **NO**, you're likely just looking to capture data rather than act on it. Technologies such as IPFS or no-SQL database platforms might provide greater value.

Do I have a good use case?

Let's Review:

4. Am I the single voice of truth for questions about an asset?

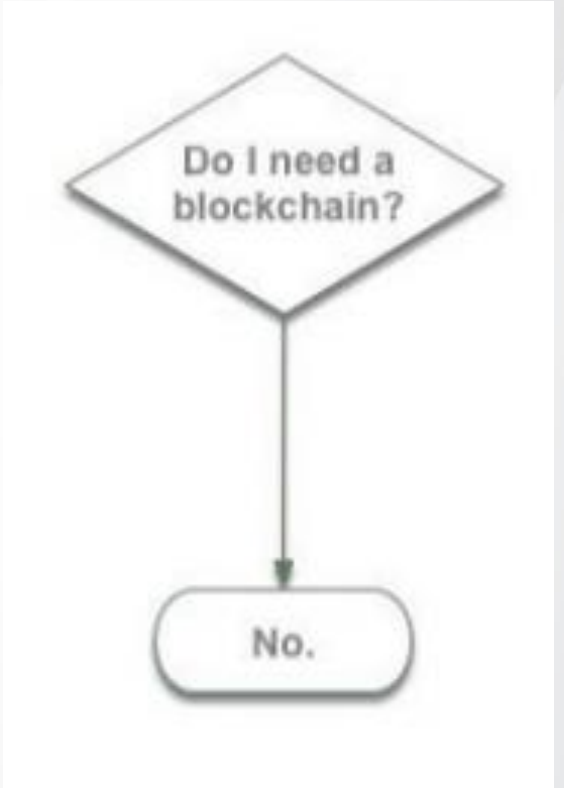
– *In most cases, as an asset evolves over time it passes through many hands. This means I am most likely but one of many custodians of an asset during certain parts of a larger, collectively-shared process.*

– If **NO**, a centralized system acting as a single source of truth is likely not an ideal fit. A decentralized authoritative system which is shared and collectively managed by all members of a business network is likely a much better fit.

– If **YES**, a database or other centralized authoritative system is likely acceptable as your organization is already the single voice of authority for questions around this particular asset.

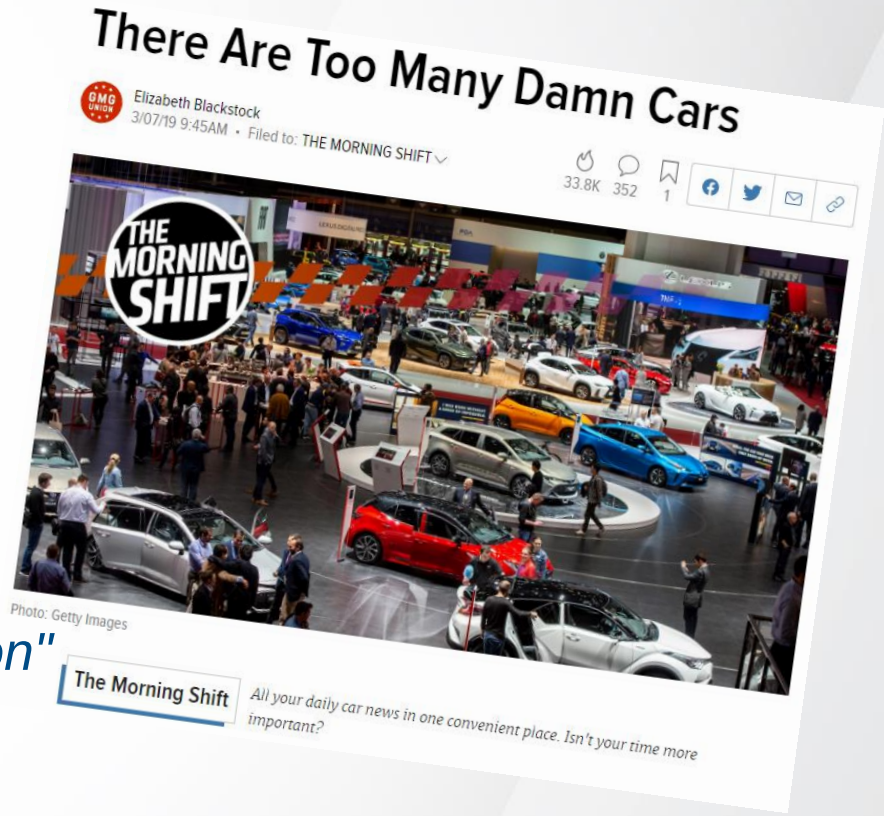
Do I have a good use case?

- Good blockchain use cases address problems and pains that conventional technology has traditionally been unable to.
  - National Association of Realtors member engagement solution
- *"Why are we talking about this blockchain stuff? Why not just use a database?"*
  - If you *could have* used a database to solve your problem, why *haven't* you?
    - Ether nobody ever thought to use one before, or…
    - …there are *non-technical* barriers or limitations, it's a **people problem** not a technology problem



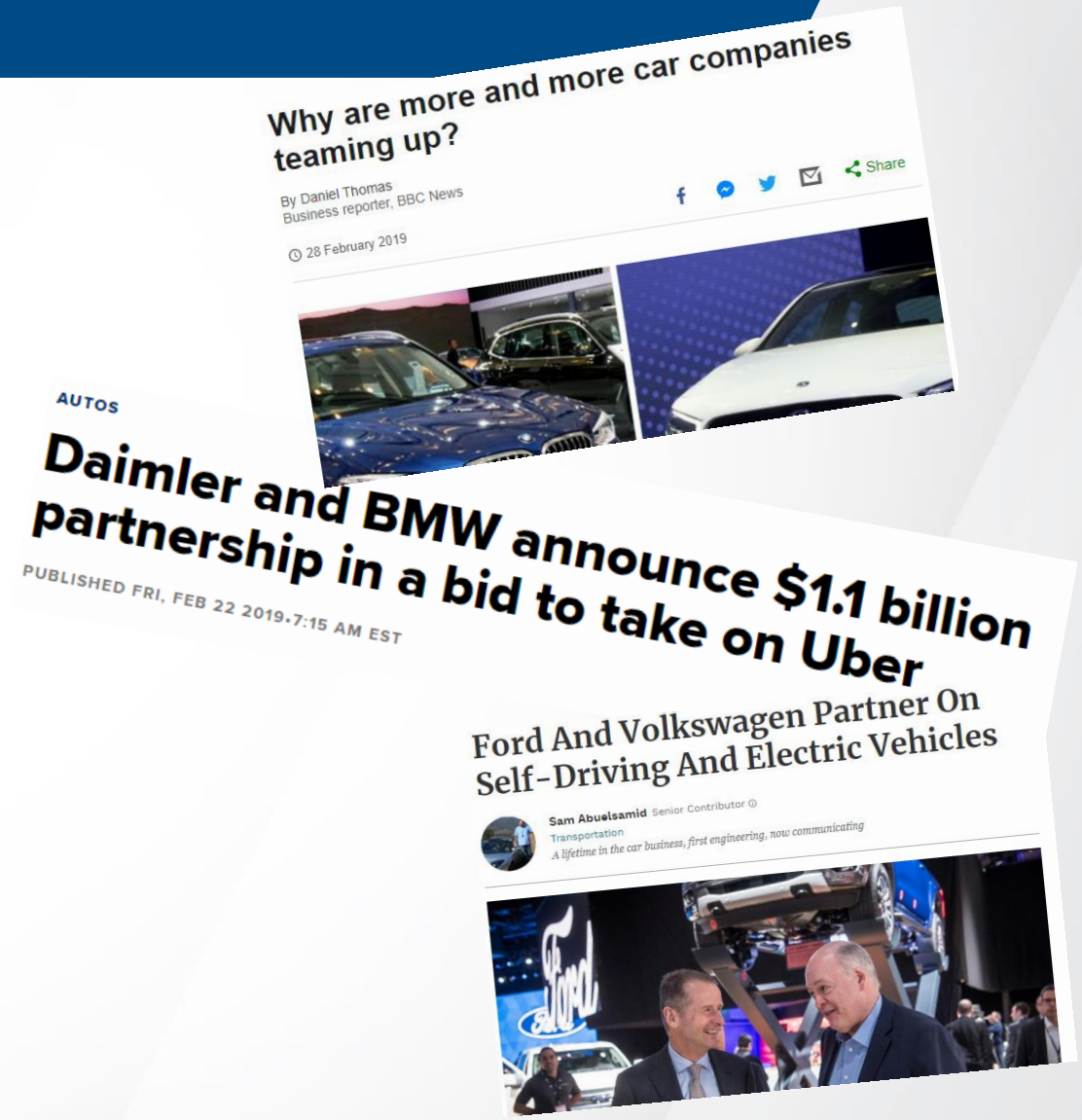
Blockchain and The New World of Business

- IT investments over time
  - 1980-2015: IT Spending 1.0, increasing collaboration, communication, transparency, and efficiency ***within*** the organization.
  - 2015+: IT Spending 2.0, increasing collaboration, communication, transparency, and efficiency ***between*** organizations.
- Collaboration is the new competition
  - *“Partnership is becoming a necessity for survival.”*
    - Elizabeth Blackstock, Writer at Jalopnik
  - *"Partnering is essential to survive the industry transformation"*
    - Klaus Froehlich, BMW head of development
  - *"Not everybody can afford to keep spending all this money, especially with how fast this innovation is coming."*
    - Don Walker, CEO Magna International Inc.



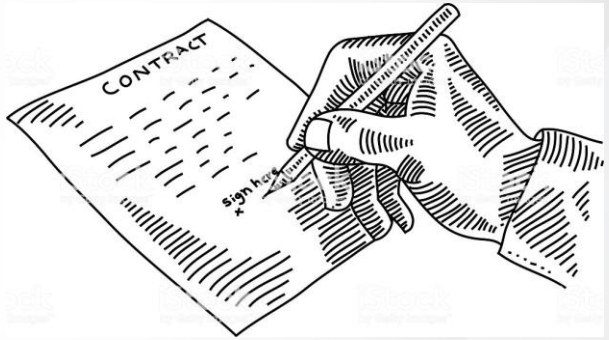
Blockchain and The New World of Business

- If Ford and Volkswagen team up to create new technology, whose database does that information live in?
  - IT initiatives will begin to cross organizational boundaries – this creates new concerns for:
    - Budgeting
    - Change Management
    - DevOps
    - Information Security
    - Project and Program Management
    - Resourcing and Scheduling
    - Post Go-Live Management and Support



Good Use Case Patterns

- Consider: What is the difference between a piece of paper, and a contract?
  - **Both** can record facts
  - Contracts also record **who agreed / endorsed** those facts at a certain point in time
- What if all critical interactions in your enterprise could be captured and signed off on by the participants?
  - What would be the benefits?
  - What processes would benefit from this?
  - What processes would NOT benefit from this?



Good Use Case Patterns

- Do not replace legacy systems, enhance them!
  - Find a system that works and already adds value, then layer Blockchain on top of it.
  - What opportunities or business capabilities open up when I can connect legacy systems to a larger ecosystem?
    - What are the pains caused by having critical systems isolated from one another?
    - What cross-organizational integrations would be beneficial to make?
      - A reseller's CRM system to a manufacturer's ERP system
  - What legacy systems might benefit from a more robust and secure audit trail?
  - What legacy systems involve processes where consent / acknowledgement / endorsement must be collected?

Good Use Case Patterns

Blockchain vs Database

- Databases are designed for ***rapidly storing and retrieving*** large volumes of data.
  - Performance > History
  - Databases will drop transactions to maintain performance
  - Dropped transactions must be re-tried
- Blockchain is a designed as a ***transaction processing and logging*** engine.
  - History > Performance
  - Transactions are **never** dropped
- All else being equal, keep your data in a database and use Blockchain to tell you *what happened* to your data.
- Databases and Blockchain work **GREAT** together!

Good Use Case Patterns

- But I need decentralized content storage too!
  - IPFS.io / Storj.io
    - Protocol, can be used in internet / intranet fashion
    - Content-based addressing, not location based addressing
      - Full version history
      - No duplicate content items
      - Performance increases as content become more popular
    - Content sharding, not all content stored in one place
    - Build applications which are decentralized on every level
      - Immune to faulty infrastructure, censorship, attack, etc

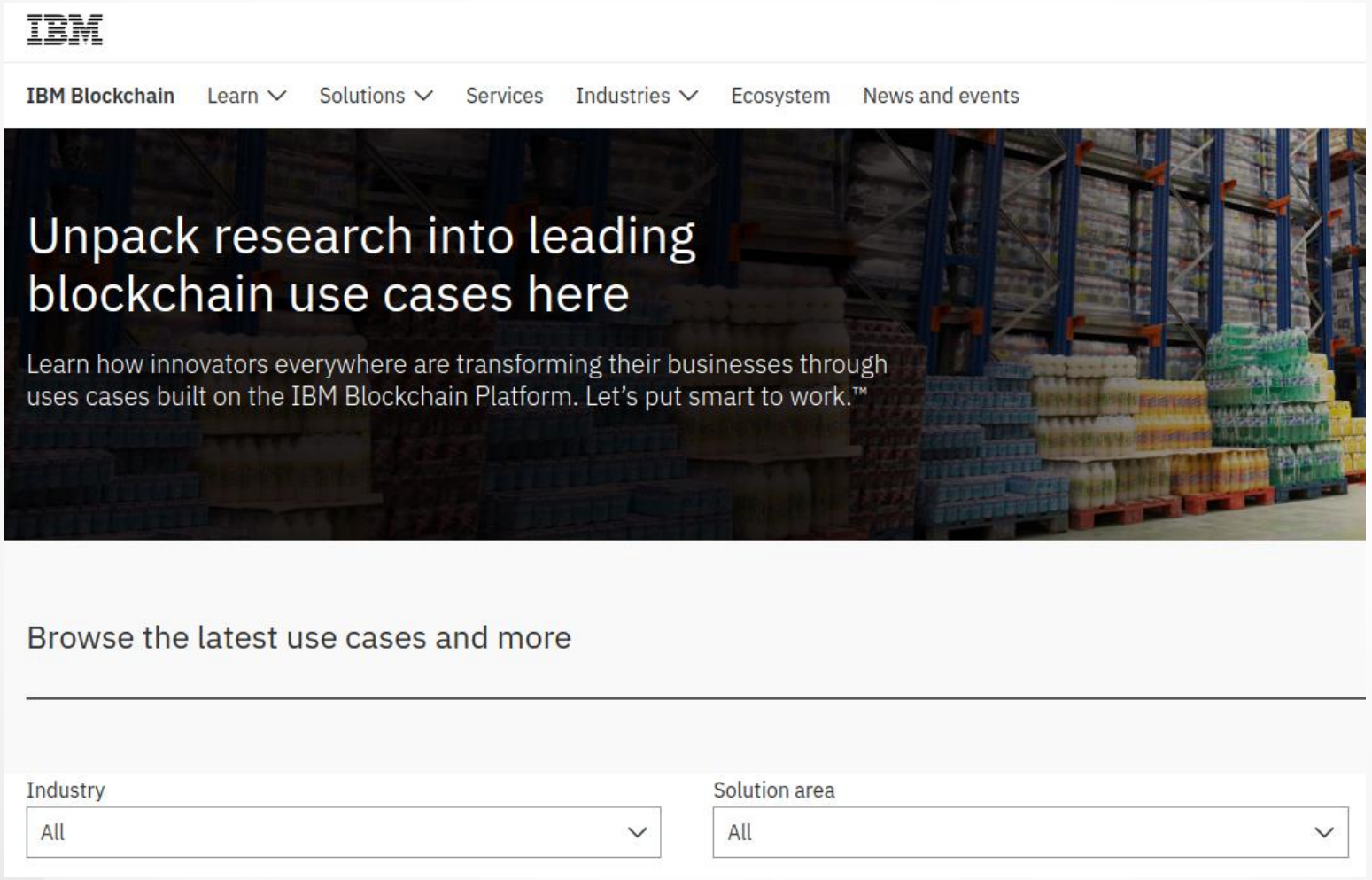
Blockchain in the Real World

Report: Blockchain Deployment Could Add $3 Trillion in International Trade by 2030

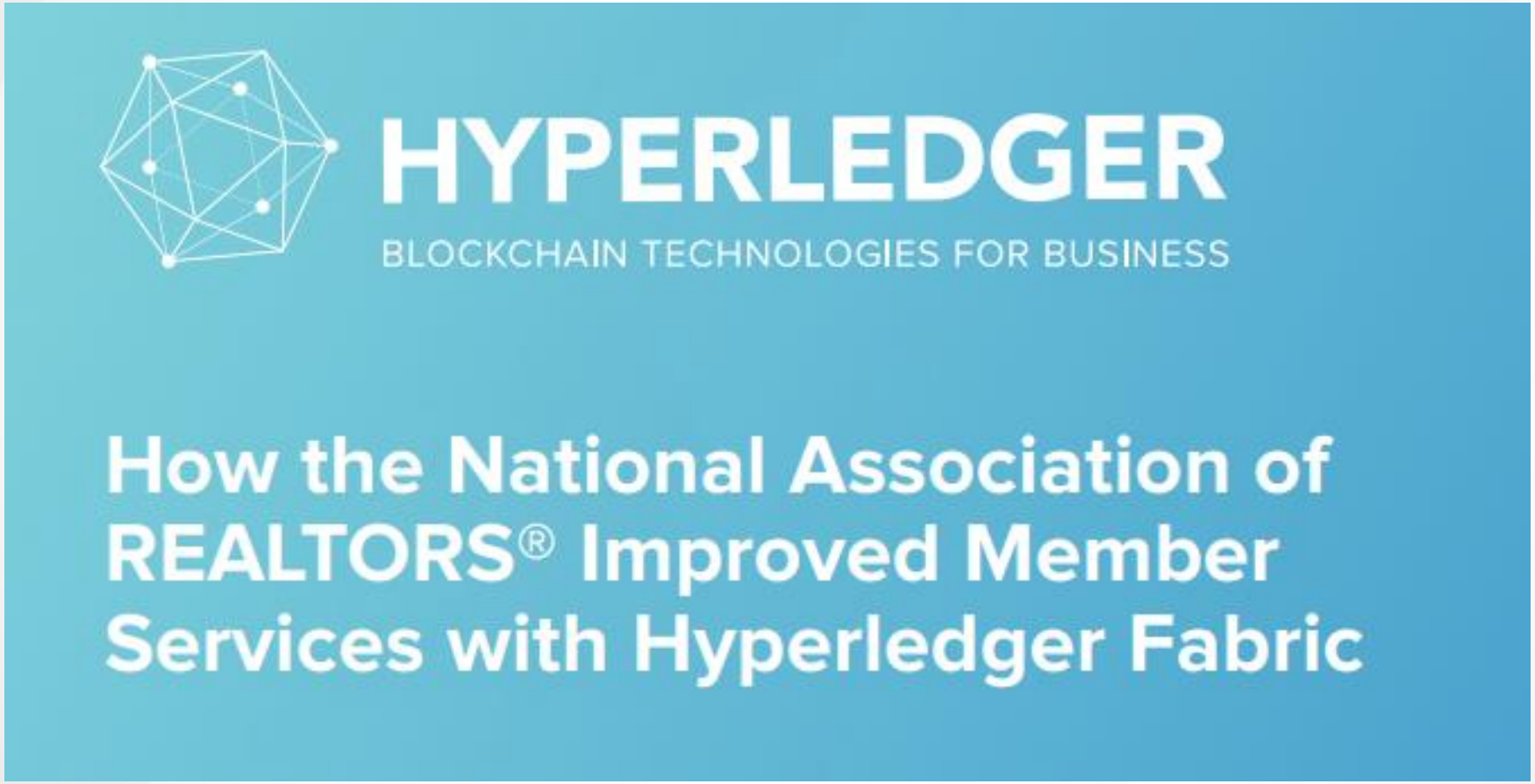
9143 Total views **336** Total shares Listen to article 2:58

The World Trade Organization (WTO) released a report on blockchain technology's effect on international trade today, Nov. 27. Per the study, blockchain's economic value-add on a global scale could reach almost $3 trillion by 2030.

Blockchain in the Real World

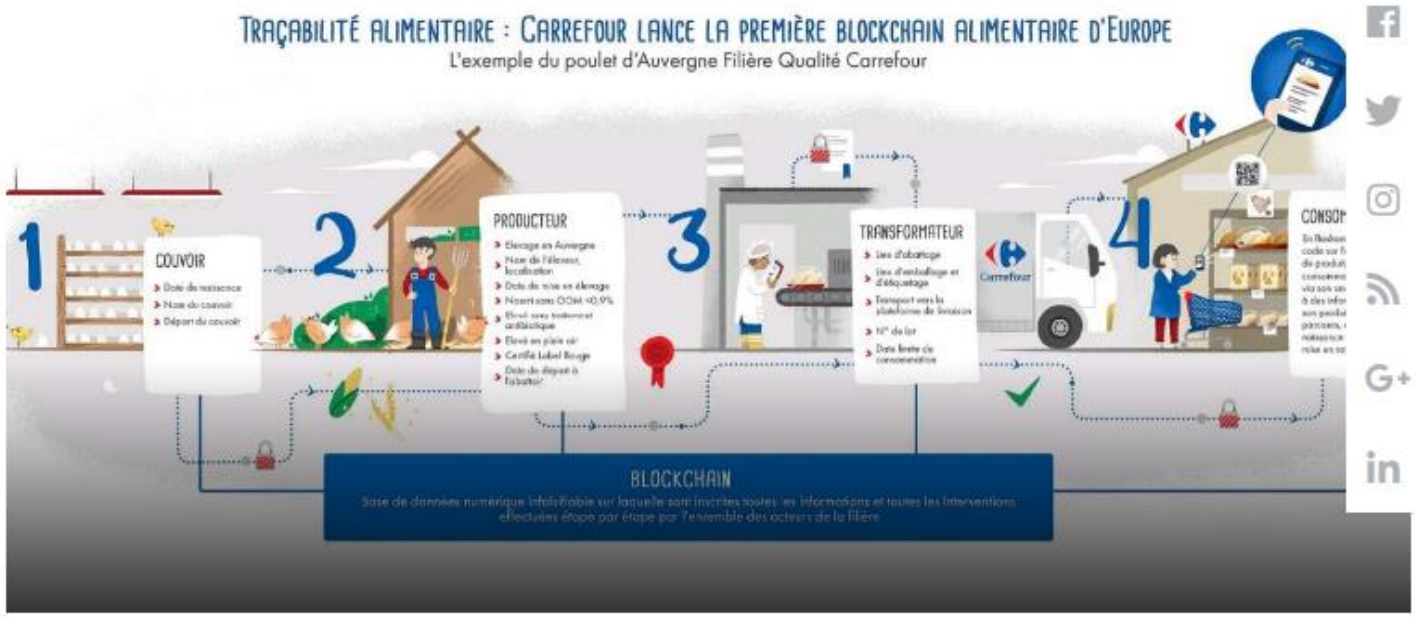


Blockchain in the Real World



Blockchain in the Real World

Carrefour uses blockchain to create "transparent" chicken



Consumers that want to know everything about the chicken they eat will rejoice at **Carrefour**'s latest addition, because it will detail everything about the origin of its private label chicken thanks to blockchain technology.

Blockchain in the Real World

IBM & Walmart Launching Blockchain Food Safety Alliance In China With Fortune 500's JD.com

Roger Aitken Contributor ⓘ

In further move to apply Blockchain technology for food traceability to support offline and online consumers, IBM, Walmart and Nasdaq-listed Chinese retailer JD.com together with Tsinghua University National Engineering Laboratory for E-Commerce Technologies have announced a

Blockchain in the Real World

Blockchain in the Real World

Maersk and IBM Introduce TradeLens Blockchain Shipping Solution

Industry-wide collaboration announced in January advances as more than 90 organizations participate in the global trade solution. More than 154 million events captured on the platform and growing by one million per day.

COPENHAGEN, Denmark and ARMONK, N.Y., Aug. 9, 2018 /PRNewswire/ -- In a follow up to their January announcement, A.P. Moller –Maersk (MAERSKb.CO) and IBM (NYSE: IBM) today announced the creation of TradeLens, jointly developed by the two companies to apply blockchain to the world's global supply chain. TradeLens is the result of a collaboration agreement between Maersk and IBM, a blockchain-enabled shipping solution designed to promote more efficient and secure global trade, bringing together various parties to support information sharing and transparency, and spur industry-wide innovation.

As part of the TradeLens early adopter program, IBM and Maersk also announced that 94 organizations are actively involved or have agreed to participate on the TradeLens platform built on open standards. The TradeLens ecosystem currently includes:

- More than 20 port and terminal operators across the globe, including PSA Singapore, International Container Terminal Services Inc, Patrick Terminals, Modern Terminals in Hong Kong, Port of Halifax, Port of Rotterdam, Port of Bilbao, PortConnect, PortBase, and terminal operators Holt Logistics at the Port of Philadelphia, join the global APM Terminals' network in piloting the solution. This accounts for approximately 234 marine gateways worldwide that have or will be actively participating on TradeLens.
- Pacific International Lines (PIL) have joined Maersk Line and Hamburg Süd as global container carriers participating in the solution.
- Customs authorities in the Netherlands, Saudi Arabia, Singapore, Australia and Peru are participating, along with customs brokers Ransa and Güler & Dinamik.
- Participation among beneficial cargo owners (BCOs) has grown to include Torre Blanca / Camposol and Umit Bisiklet.
- Freight forwarders, transportation and logistics companies including Agility, CEVA Logistics, DAMCO, Kotahi, PLH Trucking Company, Ancotrans and WorldWide Alliance are also currently participating.

Blockchain in the Real World

Mercedes-Benz Parent Company Launches a $110 Million Blockchain Pilot

June 28, 2017 3:47 pm

Daimler, one of the world's biggest car manufacturer and the parent company of Mercedes-Benz with some $175 billion yearly revenue, announced today the launch of a $110 million blockchain pilot.

"The entire transaction — from the origination, distribution, allocation and execution of the loan agreement to the confirmation of repayment and of interest payments — was digitally carried out via blockchain technology in cooperation with the IT subsidiaries TSS (Daimler) and Targens (LBBW)," a press release said.

Blockchain in the Real World

CIO JOURNAL.

FedEx CIO Says Blockchain a 'Game Changer' for S

Rob Carter sees blockchain providing more transparency and higher reliability for shipments ac

By *Steven Norton*

4 RESPONSES

May 14, 2018 4:00 pm ET

FedEx CIO Rob Carter, middle, and FedEx CEO Frederick Smith, right, talk with Don Tapscott at the Consensus 2018 conference in New York City, May 15, 2018. PHOTO: STEVEN NORTON / THE WALL STREET JOURNAL

Blockchain in the Real World

Air France KLM is Evaluating MRO Potential for Blockchain

By Woodrow Bellamy III | October 3, 2017
Send Feedback | @WBellamyIIIAC

Blockchain, MRO

Photo courtesy of Air France KLM

Air France KLM's engineering and maintenance division is evaluating the potential for blockchain to become its new digital ledger for managing replacement parts on in-service airplanes. During a recent webinar, the airline's MRO division joined Microsoft and Ramco Aviation to discuss their research into future uses of blockchain in aircraft maintenance.

Blockchain in the Real World

Anna Baydakova

Jul 25, 2018 at 00:00 UTC

NEWS

Singapore Airlines has officially launched its blockchain-based loyalty program for frequent customers.

KrisPay, a digital wallet developed in partnership with KPMG and Microsoft, allows Singapore Airlines customers to turn travel miles into units of payment, which can be used with partner merchants in

Blockchain in the Real World

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BLOCKCHAIN

The Dubai Blockchain Strategy will help Dubai achieve the vision of H.H. Sheikh Mohammed bin Rashid Al Maktoum by making "Dubai [will be] the first city fully powered by Blockchain by 2020" and make Dubai the happiest city on earth. The strategy will be using 3 strategic pillars Government Efficiency, Industry Creation, and International Leadership.

Blockchain in the Real World

Riyadh Municipality selects IBM for blockchain integration

IBM and Elm will develop blockchain solutions for Riyadh Municipality

Tags: Blockchain, Elm (www.elm.sa), IBM (www.ibm.com), Saudi Arabia

PRINT E-MAIL TEXT SIZE

By Mark Sutton
Published July 11, 2018

Riyadh Municipality has selected IBM as its strategic partner for the integration of blockchain technology.

IBM will work closely with Elm Company, the municipality's technology partner, to develop an implementation strategy to facilitate government services and transactions on blockchain.

IBM and Elm will collaborate on blockchain strategy and solutions for the Municipality.

The deployment of blockchain is intended to serve customers digitally, and to support the transformational objectives of the Saudi Vision 2030.

Blockchain in the Real World

Kerrygold faces US lawsuit over ‘grass-fed cows’ claim

Class-action suit filed in California alleges ‘false advertising’ by firm

Thu, Jul 26, 2018, 01:07

Mark Paul

Kerrygold is the second-best-selling butter brand in the US, where it grew 21% last year.

Kerrygold, Ireland’s best-known global food brand, is facing a class-action lawsuit in the United States over its marketing claim that Irish dairy cows whose milk makes the butter are fed on grass.

A San Diego-based real-estate executive has filed the case in California against Ornua, formerly the Irish Dairy Board, the co-operative that owns the brand.

Questions

Courses

Blockchain Overview: Business Foundations

(On-Demand is Free)

Blockchain Architecture Training

(CBSA Certification)

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