



# Blockchain in Government - A Perspective 2017 Year in Review

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Co-Chair AGA Blockchain Working Group

March 8, 2018

Sponsored by the NASCIO Enterprise Architecture & Governance Committee



**Bo Shevchik, MBA, CGFM, PMP**

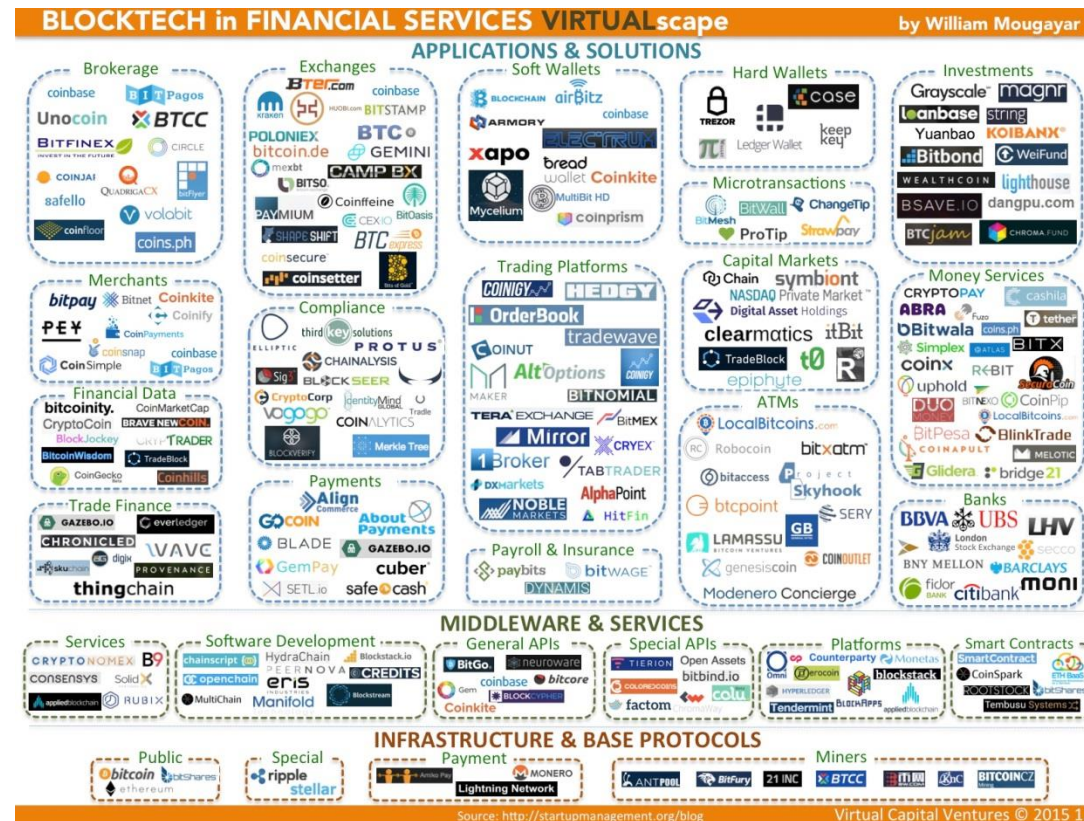
- Co-Chair Association of Government Accountants (AGA) Blockchain Working Group
- The AGA Blockchain Working Group's mission is to explore and share developments within the Blockchain/Distributed Ledger Technology (DLT) space
- Mr. Shevchik currently works for the Federal Reserve System where he is responsible for Outreach and Marketing Strategy for U.S. Treasury's Invoice Processing Platform (IPP) program.
- Mr. Shevchik has both federal and commercial experience having worked domestically and internationally in the areas of engineering, manufacturing, finance, marketing, business development and customer relations with organizations like the Federal Reserve, The Coca-Cola Company, Bristol- Myers Squibb and General Electric.
- Mr. Shevchik holds a B.S. in Industrial Engineering from Rutgers University and an MBA in Finance and International Business from New York University. He is also a Certified Government Financial Manager (CGFM) and Project Management Professional (PMP).

# Blockchain



What is it and how will it impact me?

# AGA Blockchain WG Mission



Explore and share developments  
Educate and inform membership



# March

Organization	Topic	Presenter
PwC	Cryptoeconomy for Humanitarian Aid	Dave Fragale
DHS	Identity Management R&D Program	Anil John
Treasury FIT	Approach to Distributed Ledger Technology	Craig Fischer

## Sample use cases

**Fraud, waste and abuse**  
Cryptoeconomy for Humanitarian Aid  
PwC's blockchain prototype to deliver \$300B/yr. in funds / supplies for humanitarian aid and international development projects

**Secure, consolidate medical history**  
Digital Identity for Medical Records  
A distributed ledger with medical records for individual patients. Records secured using patients biometric data, and securely shared. Allow medical professionals to focus on treatment

**Food safety, contamination**  
US Retailer, Tech Firm Partnership  
E.coli, norovirus and salmonella incidents continue to pop up in the news. Major US retailers are exploring ways to use blockchain to digitally track the movement of materials in supply chain

**Lack of traceability**  
in Gold Markets  
Implementing blockchain to push transparency into the gold supply chain to help address Conflict Gold, forced labor and violence

Companies are now focusing on supply chain use cases for blockchain technology

## Approach to Distributed Ledger Technology

### 1 Understanding the Basics

#### Notable Applications / Platforms / Consensus

### 2 Raising Awareness

#### Distributed Ledger 101

- Basically, a distributed ledger is a database on a network that everyone has access to and everyone can make and see "peer-to-peer" transactions in near real-time
- There are 5 basic principles underlying blockchain technology:
  - Distributed Database** - Each party has a copy of the database
  - Peer-to-peer Transmission** - No middle person
  - Transparency** - Every transaction "can be" visible
  - Immutability of Records** - Transactions are linked to every transaction record that came before it
  - Computational Logic** - Algorithms and rules can automatically trigger transactions when certain conditions are met (e.g., Smart Contracts)

### 3 Understanding How it Works

#### How does it work?

### 4 Exploring Use Cases

#### BlackBerry Inventory Management

Future state process depiction (new employees)

## Current State of Blockchain Technology

**Hype**

- "... lets users – the crowd – police the monetary system ..."
- "... initiative in Africa to stamp out corruption ..."
- "... provide unlimited communication channels ..."
- "... get rid of lawyers via smart contracts ..."

**Reality**

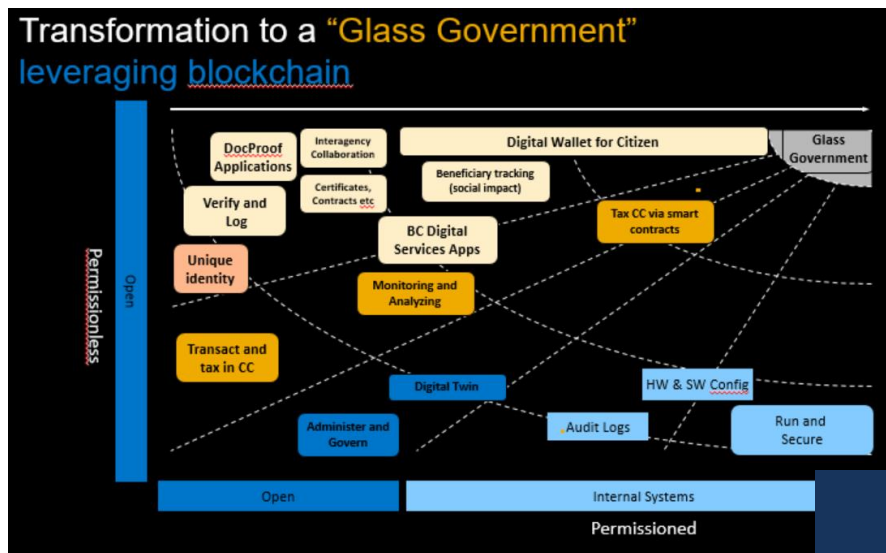
The underlying electronic ledger technology that makes the Bitcoin currency possible has some interesting properties

- No central authority needed to reconcile the ledger
- Parties in the transaction do not have to trust each other

**Security Privacy**

# April

Organization	Topic	Presenter
SAP	Blockchain Use Cases	Heinrich Pfriemer
Chamber of Digital Commerce	Blockchain Overview	Jason Brett



What problems can  
Blockchains solve?

How do they solve  
them?

# May

Organization	Topic	Presenter
Circle	Hash	Anders Brownworth
CGI	Blockchain in Trade	Kitt Carswell

Blockchain 101 - A Visual Demo

Blockchain

Block: # 3

Nonce: 37

Data:

Prev: 012fa9b916eb9078f8d98a7864e697ae83

Hash: 0b9015ce2a08b61216ba5a0778545bf4d

Mine

Block: # 4

Nonce: 35990

Data:

Prev: 0000b9015ce2a08b61216ba5a0778545bf4d

Hash: 0000ae8bbc96cf89c68be6e10a865cc47c6c4f

Mine

Block: # 5

Nonce: 56265

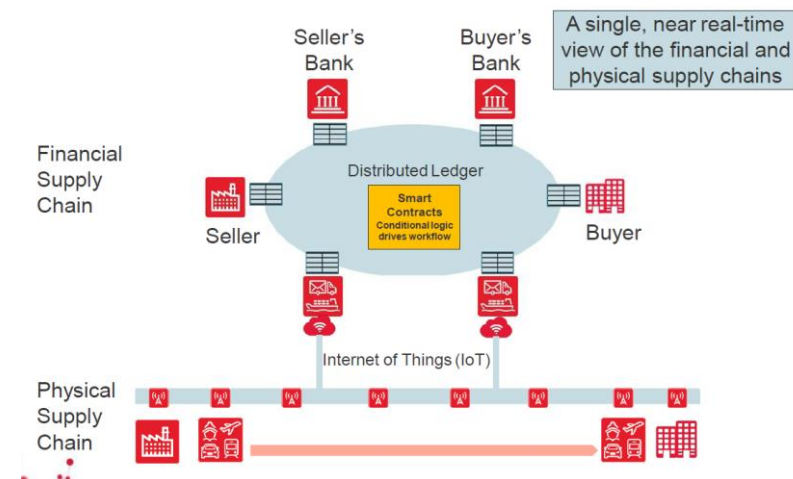
Data:

Prev: 0000ae8bbc96cf89c68be6e10a865cc47c6c4f

Hash: 0000e4b9052fd8aae92a8afda42e2ea0f1797

Mine

## Future View of the Trade Environment



# June

Organization	Topic	Presenter
Deloitte	Blockchain Labs and Use Cases	Anastasia Traylor
Bitfury	Land Titling	Jamie Smith Rachel Pipan

## DELOITTE'S EXPERIENCE ACROSS KEY BLOCKCHAIN USES

Deloitte actively invests in building proof-of-concepts to gain hands-on experience with blockchain technology and to bring to clients as use-case accelerators



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## Government/ LAND TITLING IN REPUBLIC OF GEORGIA

### Previous System – 3 days

**Citizen**  
Terms of registration, commissions, risks of data loss

**Government**  
Alternation of power increase the risk of fraud

**Investor**  
Operating expenses of purchase and sale (\$3000)

Lawyer  
Database  
Certificate



### Blockchain System – 10 minutes

**Citizen**  
Operations are carried out instantly from the phone using modern identification schemes

**Government**  
Built-in transparency increases level of trust to the current government

**Investor**  
Reliable cadastre reduces investing risks

Personal phone  
Smart-contract  
Blockchain





Organization	Topic	Presenter
PwC	Blockchain 101	Moderator Bill Hughes PwC, Presenters: Nancy Amert CGI, Craig Fischer Treasury FIT, Jim Cunha FRBB, Dave Fragale PwC
Federal Reserve Bank of Boston	Digital/Crypto Currency and Distributed Ledger	Moderator Bo Shevchik FRBB, Presenter Jim Cunha FRBB

## Blockchain 101

Jim Cunha, Craig Fischer, Nancy Amert, Dave Fragale, Bill Hughes

- 183 attendees
- 31 Questions – Top 4
  1. Does anyone own or profit directly from blockchain or is this an open system
  2. Can one of you explain how blockchain works using a sample transaction
  3. In a nutshell why do I Joe American want this Just to stop my bank fees
  4. How involved should the federal government become in regulation of cryptocurrencies in order to reduce public risk while not stifling innovation

## Digital Crypto Currency and DLT

Jim Cunha, Bo Shevchik

- 192 attendees
- 28 questions - Top 4 vote getters
  1. Sounds like there is a finite number of bitcoins If so what are the implications in terms of money supply
  2. How do you get bitcoins to start - Do you use currency?
  3. Can bitcoin be converted into dollars If so how?
  4. I've heard a lot about bitcoin and its use for dark web transactions How much is it used for regular world transactions?

# August

Organization	Topic	Presenter
Factom	Blockchain for Compliance Auditing	Jason Nadeau Tiana Laurence
ConsenSys	Blockchain Types	Jason Brett

DEPARTMENT OF HOMELAND SECURITY  
FACTOM TECHNOLOGY TO SECURES BORDER CAMERAS



MORTGAGE DOCUMENTATION  
COMPLIANCE AND EVIDENCE DOCUMENT PRESERVATION



## Modern "Blockchain" Systems



	ETHEREUM	HYPERLEDGER	BITCOIN	CORDA*	RIPPLE
Consensus Algorithm	Proof of Work (Proof of Stake)	PBFT	Proof of Work	BFT or RAFT	Ripple Protocol
Enterprise Use	Enterprise-grade DApp development	Enterprise-grade DApp development	Remittances and money transfer	Finance focused blockchain-inspired application development	Remittances and money transfer
Network Size	Global	Limited	Global	Limited	Limited
Protocol Implementation(s)	Go, C++, Python, Haskell, Java, Rust, Ruby, JavaScript	Go, Java	C++, Java	Kotlin, Java	N/A
Consortia	Enterprise Ethereum Alliance	Hyperledger Foundation	N/A	R3	N/A
Native Digital Currency	Yes	No	Yes	No	Yes
Built-in Smart Contracts	Yes	Yes	No	Yes	No
Blocks	Yes	Yes	Yes	No	No
Mining	Yes	No	Yes	No	No
Public / Private Interoperability	Public, Private / Permissioned, Permissionless	Private / Permissioned	Public / Permissionless	Private / Permissioned	Private / Permissioned
Developer Community Strength	50,000+	182	N/A	N/A	N/A

# September

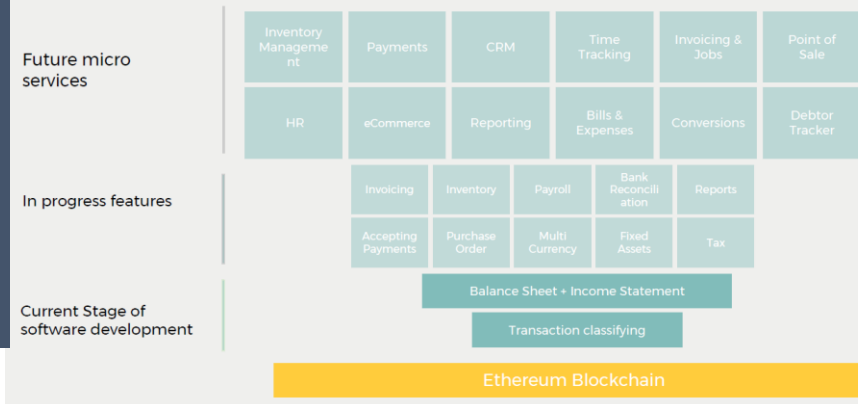
Organization	Topic	Presenter
Health Wizz	Blockchain - A Disruptive Remedy for Healthcare	Raj Sharma
ConsenSys	Balanc3 Triple Entry Accounting	Griffin Anderson

## Why blockchain for health records?

Health records are digital assets that are confidential and have value when shared or traded. Blockchain provides a highly efficient medium of exchange without trusted third parties extracting value:

- **Consensus:** Trusted because all parties must agree to network verified transactions.
- **Immutability:** Anything written on the ledger cannot be altered.
- **Provenance:** Origin and ownership of records can be verified.
- **Privacy:** Permissions and identity ensure appropriate visibility of transactions.

## / Balanc3 Vision



# October

Organization	Topic	Presenter
CGI	CGI's Trade Innovation Lab	Nancy Amert
Token	Token API	Michael O'Loughlin

## R3, CGI & Eleven Banks Develop Blockchain-based Trade Finance App

Aug. 7, 2017: Following a year of development and testing, [R3](#), [CGI](#) and eleven banks unveil a prototype of a trade finance app built on R3's Corda distributed ledger technology (DLT). The participants say the [blockchain](#)-based app incorporates shippers and carriers, and "holds potential to improve trade flows, particularly for SMEs in developing economies." It could "significantly reduce inefficiencies and costs by streamlining the processing of sight letters of credit [LCs]," they explain.

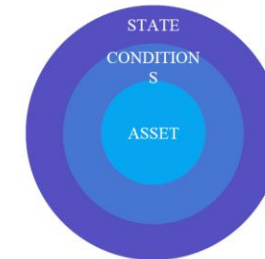


R3, CGI and eleven banks develop blockchain-based

Powerful New Value-Transfer (Patent Pending)



Limited control, insecure, value only



Smart token

Unlimited control, secure, bank enforced, digitally signed, Value & Information



# November

Organization	Topic	Presenter
Sapient Consulting	Blockchain Lesson Learned from Actual Federal Government Implementation	Aleksandar Zelenovic
SAP	Blockchain at SAP	Rudy Subramanian

Blockchain Implementation for the  
Federal Government: Lessons Learned

Defense Supply Chain



TrueRec powered by  
Blockchain offers trusted  
digital credentials.

It enables individuals to be in  
**control of their credentials**,  
guarantees **authenticity**, and  
allows **instant verification**.

# December

Organization	Topic	Presenter
Grant Thornton	BITCOIN Anonymity – Gradients of Truth	George Taggett
Microsoft	Blockchain Ecosystem in Azure Government	Kevin Leffew

## THE QUESTION

Is Bitcoin Anonymous

## Blockchain Solutions: in Azure Government

### Now:

- ARM templates for network deployment/configuration
  - Ethereum, Fabric Corda, Quorum, etc.
- Developer Tooling (Visual Studio / VS Code)

### 2018:

- Enterprise Smart Contract (Cryptlet) Framework
- Confidential Consortium (Coco) Framework
- Blockchain 'App Builder' in Azure

### Soon:

- Blockchain-rooted Decentralized Identity (DID)

# January

Organization	Topic	Presenter
AID:Tech	Real World Applications of Blockchain	Joseph Thompson Niall Dennehey
Treasury FIT	DLT Proof of Concept Briefing	Craig Fischer Cassandra Madden

## the delivery of digital entitlements via digital identity

AID:Tech
HOME
ABOUT US
PRODUCT
CASE STUDIES
NEWS
CONTACT US

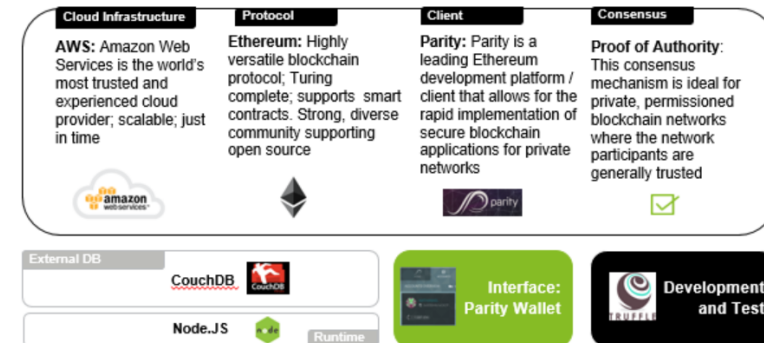


### INTERNATIONAL AID

AID:Tech's platform enables the remote distribution of international aid. We can also provide digital identity in the form of smart cards with unique QR codes to achieve last mile provision.

## Proof of Concept Technical Details

For each design consideration, the team analyzed several alternatives and designed the following technical stack that best suited the business needs



Trust .... At a Cost

Wake up call  
for

Intermediaries

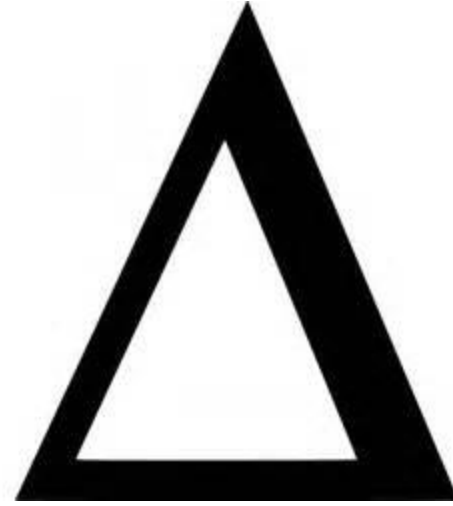
(clearing houses, corresponding banks, exchanges, etc...)



# Key Takeaways

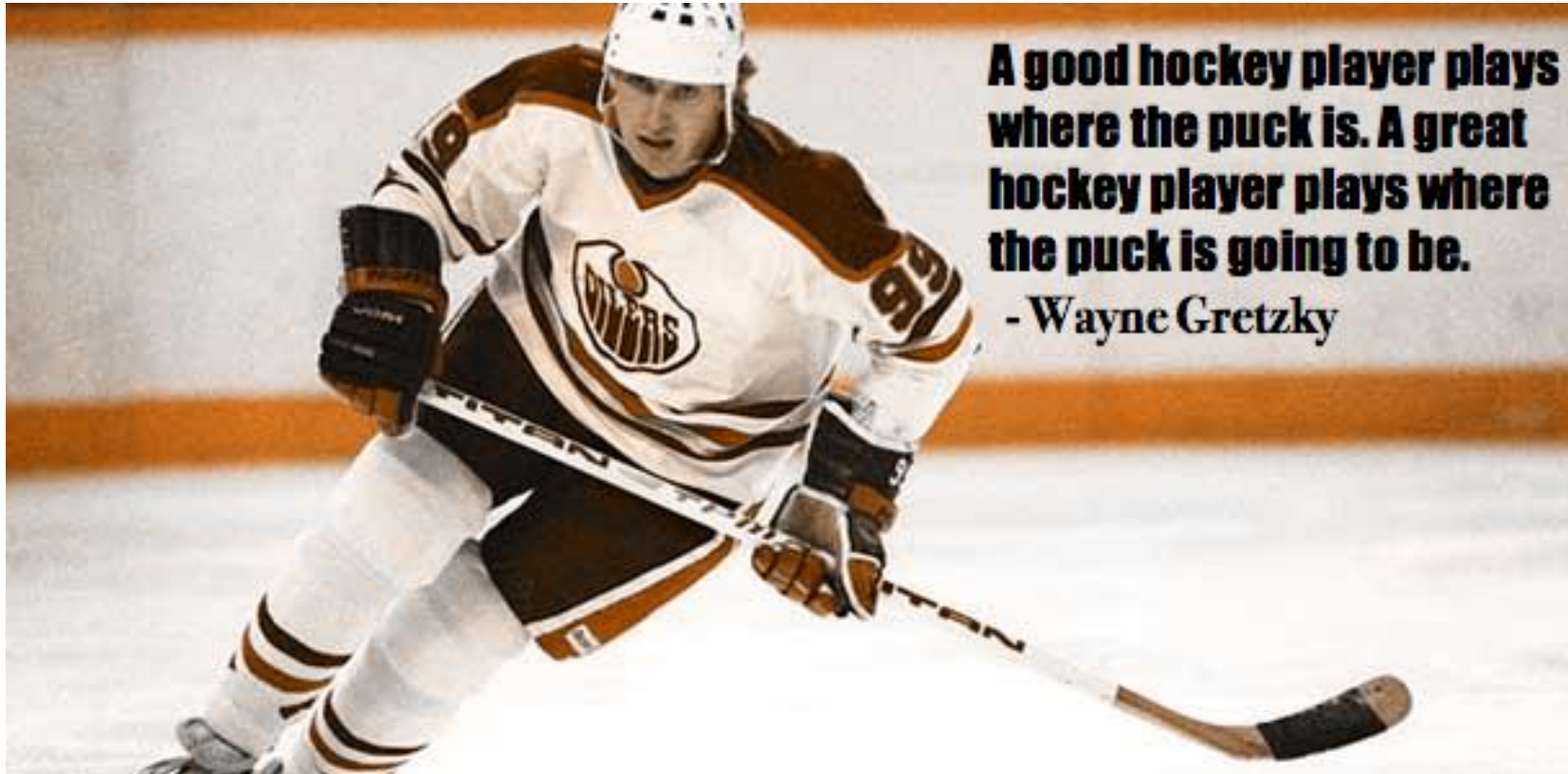
1. Original purpose was to prevent double spending, but the technology is portable and can be repurposed
2. DLT is not a panacea, but rather another tool in the toolbox
3. DLT has a lot of potential, but it's still relatively immature

# Change



- It's really hard to bring about actual change
- The whole world conspires to stop change from happening
- AGA - Bring people together - create change!

# Go to where its going to be!



**A good hockey player plays  
where the puck is. A great  
hockey player plays where  
the puck is going to be.**  
- Wayne Gretzky

# Contact Info

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Association of Government Accountants (AGA)

Blockchain Working Group

<https://www.agacgfm.org/Corporate-Partners/CPAG-Committees/Committee.aspx?ID=BLK>



# Questions





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