CFTC Technology Advisory Committee

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Distributed Ledger Technology Sub-Committee

Presenters:

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Agenda

Resiliency and Scalability in DLT

Introduction and Challenges

Market Applications

Regulatory Implications and Questions

Resiliency & Scalability in DLT

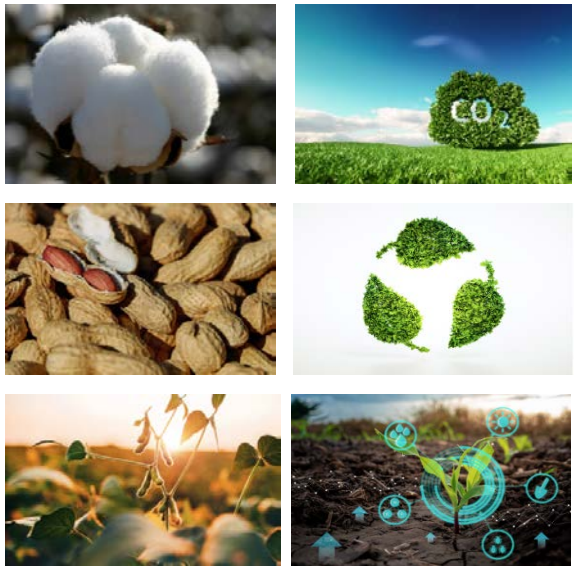
- Resiliency and Scalability are critical to the functioning of any DLT system in derivatives.
- Both values are connected: the more scalable a system, the greater the need for resiliency.
- Scalability can implicate considerations of system-wide risk and stability, making resiliency a priority in market design.

Introduction & Challenges: Key Features of DLT

- A digital system of data verification for transactions, assets and users…
- That is decentralized and automated. Network nodes automatically apply pre-set verification protocols to ensure that the data is authentic.
- Network nodes rely on consensus to verify data accuracy and authenticity.
- Once verified, data is cryptographically recorded on the ledger. The ledger is immutable and aims to be impervious to tampering.

Market Applications

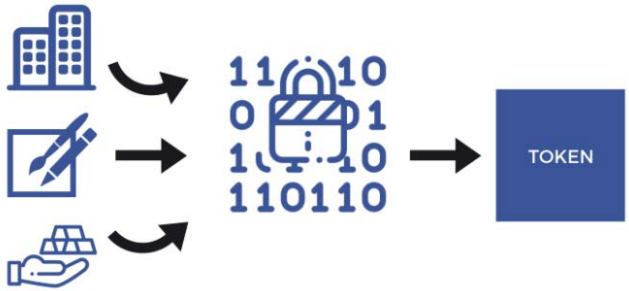
Asset Tokenization in Agricultural Commodities.



Mark Pryor, CEO
The Seam

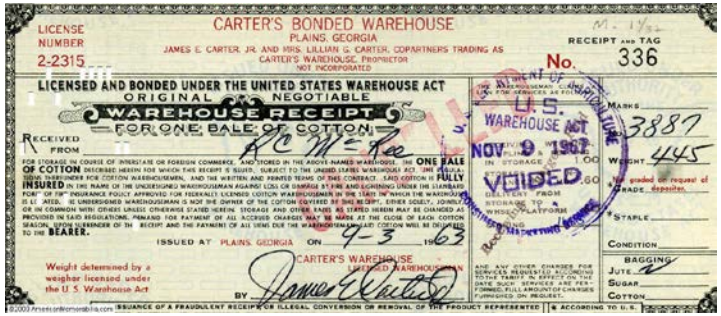
Token:

An abstract digital representation of some “fact”, claim or physical object.



Physical and Non-Physical Assets

Historic Forms of Tokenization


CARTER'S BONDED WAREHOUSE
PLAINS, GEORGIA
LICENSE NUMBER 2-2315
LICENSED AND BONDED UNDER THE UNITED STATES WAREHOUSE ACT
ORIGINAL NEGOTIABLE
WAREHOUSE RECEIPT
FOR ONE BALE OF COTTON
RECEIPT AND TAG No. 336
U.S. WAREHOUSE ACT
NOV 9 1967
VOIDED
MARKS 3887
WEIGHT 445
ISSUED AT PLAINS, GEORGIA ON 4-5 1963
CARTER'S WAREHOUSE

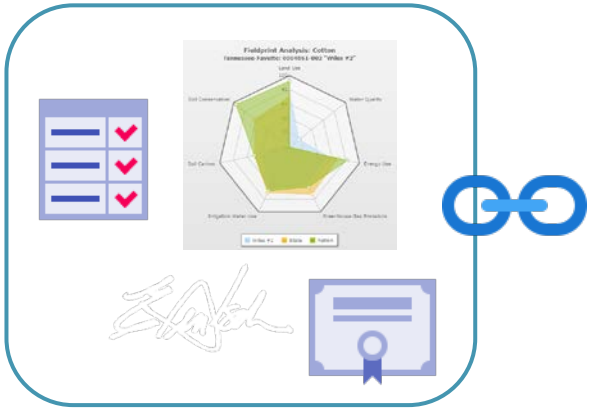
Electronic Warehouse Receipt

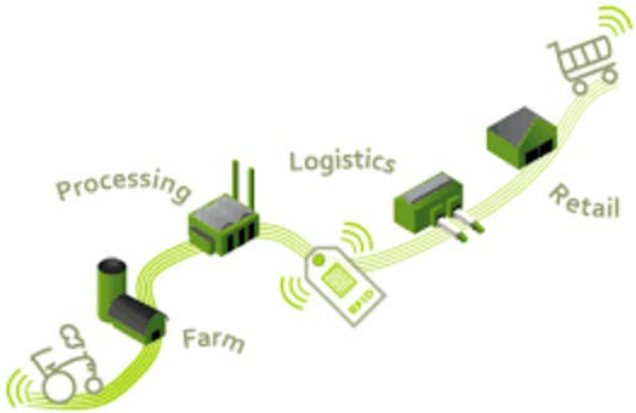
1995

Types of Tokens

Fungible	Non-Fungible
Carbon Credit (ton)	Identity Preserved Commodity (specific physical bale of cotton)
Sustainable Production Claim (kilo)	Unique art, collectible
U.S. Dollar	

Sustainable
Farming Practices





The sustainability practices used in the production of agricultural goods **must be digitally linked with the actual production.**

National Cotton Council OF AMERICA

U.S. COTTON TRUST PROTOCOL SUSTAINABILITY

Fungible Tokens

Certified claims
1 token = 1 kilogram
of verified sustainably
produced cotton.

Non-Fungible Tokens

Physical
representation,
actual bale

Carbon Credit Tokens

Represents the **right** to one ton of carbon dioxide removals.

Created from **verified sustainable farming practices**, farmers remove carbon from the atmosphere and store it in their soil.

By 2030, Microsoft commits to become **carbon negative**, meaning that it **will** remove (buy down) more **carbon** from the atmosphere than it emits.

Token Standards

Standard	Description
ERC-20	Fungible token, useful for bulk commodities, interchangeable, volume-based claims, certificates
ERC-721	Non-Fungible token. Identity Preserved Commodities. Unique, one-of-a-kind.
ERC-998	Non-Fungible, composable token. Represents more than one digital asset (containerization)
ERC-1155	Multi Token Standard. A single deployed contract may include any combination of fungible tokens, non-fungible tokens or other configurations.

One (1)
ERC-1155

Ninety (90)
ERC-721's

InterWork Alliance

The **InterWork Alliance** (IWA) is a non-profit, member-led organization creating platform-neutral specifications and trusted certification to define how digital token business processes can **interwork** regardless of location or market segment.

Agriculture is Advancing with DLT and Asset Tokenization.

Thank you!

Regulatory Implications

Introduction & Challenges: Design Choices

- Regulatory implications depend on design choices for any DLT system. Some key ones include:

  - **Permissioned vs. Non-Permissioned:** Non-permissioned systems may be more scalable, but they can lack resiliency and accountability.
  - **Use of Smart Contracts:** DLT systems can be combined with specific code, e.g. to automatically transfer money/securities/reporting data. Use of smart contracts add utility and scaling but requires attention to ensure resilience and resistance to error and tampering.
  - **Interoperability:** DLT systems that connect into existing infrastructure (e.g. for payments/securities settlement) raise concerns about ensuring continuity, resilience, systemic stability and accountability.

Regulatory Issues: Resilience

- DLT systems can be permissioned or non-permissioned.
- Permissioned systems can offer greater resilience and control. Participants must be cleared to participate by DLT system operator. They can also be held accountable.
- This helps ensure that all nodes are cleared and deemed to be non-malicious, deploying strong technology, cryptography and adhering to in compliance with eligibility conditions.
- Permissioned systems may encourage greater use of automated smart-contracts within closed, trusted networks.
- Permissioned systems rely on an operator that has the expertise, experience and resources to run the DLT system.

Regulatory Issues: Resilience

- Resilience means investment in top-quality compliance and technology. It also implicates accountability and liability.
- High compliance costs can exclude smaller players that lack resources from offering innovations
- Resilience also requires attention to phasing in migration and interoperability of DLT systems with existing market infrastructure.
- This can limit scalability and network effects. Market participants may be discouraged from adapting to DLT if the timetable for phase-in is long and initial use cases are discrete or small-scale.

Regulatory Issues: Scaling

- Scaling implicates a number of regulatory concerns for DLT systems:

- Non-permissioned systems are likely more scalable. But unlikely that they be used in derivatives markets without risking resilience. There is no locus of accountability, monitoring and control.
- Scaling will mean a system that processes vast quantities of data. Will this demand add latency? Will it increase the chance of errors, outages, tampering or manipulation?
- How will the data embedded in a digital ledger be "stored" and "protected?" If a system is international, how will issues in relation to privacy, data portability, and cybersecurity be regulated?
- How will regulators access data on the ledger? Will data access create regulatory cooperation or competition between states?

Regulatory Issues: Scaling

- Scaling also raises issues in relation to how an emerging DLT system will be governed:

- Permissioned DLT systems, especially if widely used, will require attention to their governance model.
- What powers will an operator have to control the workings of the system? What responsibilities will attach to the monitor? How will the monitor be held accountable?
- Who gets to join a DLT network? Will criteria for entry entail new conditions distinct from those required to join an exchange today (e.g. specific cryptographic expertise)?
- How will risk and responsibility be allocated between the members of the DLT network? If costs for joining the network are high, membership will be lower.

Some Regulatory Approaches?

- How should regulatory approaches in relation to emerging DLT be crafted?

- Challenge owing to a new and emerging technology. Use cases are being highlighted, but development takes time. The technology can change and improve rapidly.
- Should we use and tweak existing regulatory approaches, such as applying Title VII's approach where a technology seeks to provide services in relation to swaps settlement?
- Do the Principles for Financial Markets Infrastructures provide a starting point?
- Or, are existing approaches too costly and likely to discourage innovation (especially by smaller, niche players)?

Some Regulatory Approaches?

- Proportionality provides a possible way forward, offering a risk-based, tailored model.
- This allows ratcheting up of regulations and compliance burdens when a technology becomes more scalable.
- It can allow small players room to innovate within established parameters without causing prudential risk.
- Where DLT systems are proven and ready to be adapted on a larger scale, they can be more rigorously overseen.

Ongoing Questions and Concerns

- How to build cross-border DLT systems to verify data for international transactions? Derivatives are international.
- Success of DLT systems internationally will depend on cooperation and coordination between regulators.
- Data regulation, liability, monitoring, governance questions require cross-border standards to ensure international scaling.
- How will this be achieved? Is standard-setting viable in this area? Will CFTC take the lead?
- How should market participants proceed in the meantime? Are industry standards a partial substitute?

Questions?

Thank you!