Block Chain Technology in Agriculture

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Defining It
Some Details
Examples



But, First...

- Most of Us Think of Bitcoin
- Cryptocurrencies and Other Maybe Nefarious Uses
- These are Uses of Blockchain Technology
 - Other business uses
 - Applications to agriculture

In The Beginning

Core Idea First in 1991 Electronic signed information chain used an electronic ledger for digitally signed documents Digital Cash in 2008 - Bitcoin

Definition

- "Blockchains are immutable digital ledger systems implemented in a distributed fashion and usually without a central authority"
 - National Institute of Standards and Tecnology, USDC, Jan 2018

Basics

- •Users (Community) Record Transactions in Ledger
- Ledger Public to Community
- Once Published, Can't be Changed
- Everyone Keeps Full Record, Hard to Alter, Corrupt, Forge

A Little More Detail

- Each has Same, Uniform Worksheet
 On your computer and in "cloud"
- Enter Data Into Worksheet
 - Checked, verified by program
 - Signed, agreed to by others
- After Validation, Group of Transactions Becomes "Block"
 - Verified, time stamped, locked no more changes
- Unique Identifier for Each Block
 - Group of blocks form chains of verified data

How it Works.



Each Participant keeps a copy of records relevant to their transactions on a blockchain.

Source: Ledgerspace, LLC

Uses

Smart Contracts

- Details already agreed to by people
- Written in digital ledger
- System executes the contract
- Back Office
 - Verify transactions

Transparent Information

 Provenance of product, easy to show, share information, proof

Traceability

- Food recalls
- Walmart/IBM pilot cut time to track package of mangoes from 7 days to 2.2 seconds

Examples

- IBM Food Trust
 - Network from Producers to Retailers
- Nestle's Gerber Baby Food
 - Partner with Dole, Driscolls, Kroger, Tyson, etc
 - Makers of ingredients that go into baby food and retailers
- West Virginia Voting App
 - Mobile tech
 - Indelible record of votes cast
 - Doesn't authenticate voter before vote, security problems?

Economic Implications

- Reduced Transaction Costs
 - Price impacts for adopting suppliers
 - Can you get shut out of market?
- Faster Recall of Information
 - Food safety
- Reduced Risk

Roadblocks

- Getting More Companies to Sign On
 - More in block
 - Group together supply chain
- Dependent on Networks
 - Uniform formatting
 - Integrate within each companies records
- Universally Accepted

Roadblocks

Think About Meat

- One input goes in multiple products come out
- Box of briskets or steaks go out, ground meat
- Garbage In, Garbage Out
 The original data

Some Readings

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- Baker, M. "Blockchain for Babies." Freightwaves. August, 2018.
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- Nguyen, T. "West Virginia to Offer Mobile Blockchain Voting App." The Washington Post. August 13, 2018.
- Notes from World Meat Congress May, 2018. Gary Rodrigue, IBM Food Trust Presentation.



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THANK YOU!