



UNIVERSITY OF
ARKANSAS

School of Law

Agribusiness and all things Crypto: The Basics.
Professor Carol Goforth

1

Part 1—Introduction to Blockchain and Crypto

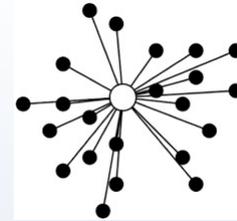
What is Blockchain? What is Bitcoin?



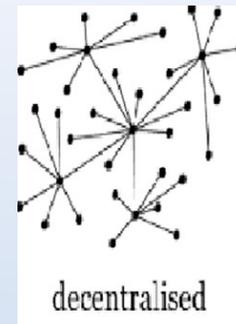
2

Introducing Cryptoassets and Blockchain technology

*Traditional currency transactions depend on a trusted intermediary who maintains the ledger of financial transactions (typically a bank)



*the goal of blockchain was to allow transactions without the intermediary (increased access for the unbanked, increased privacy, decreased costs, increased speed)



3

Introducing Cryptoassets and Blockchain technology

*Blockchain technology starts with a computer program that is uploaded to a number of computers. Those computers form a network, and the underlying computer program is the platform on which the network functions.

*The purpose of the computer programming is to keep a record, or ledger, of valid transactions (replacing the bank as the intermediary in a centralized system).

Ref No	Date	CHK	Pages	Amount	Pages Name
	4/28/2011	CHK	0	\$2,351.00	Bookend, Neal
	4/28/2011	CHK	63	\$1,796.34	Martin, JoAnne
	4/28/2011	CHK	1	\$3,121.58	Nance, Ralph
	4/28/2011	CHK	121	\$1,428.82	Gilbert, Wanda
	4/28/2011	CHK	3005	\$137.26	Kaves, Mark
				\$8,840.94	

Account	Description	Debit	Credit
1-222128	Hospitalization W/field	\$0.00	\$125.00
1-222118	Pension Plan-Contributions	\$0.00	\$50.00
1-229108	Federal Taxes - Church	\$0.00	\$185.58
1-229118	FICA Taxes Payable - Church	\$0.00	\$222.31
1-229128	Medicare Taxes Payable - Church	\$0.00	\$61.98
1-229138	State Taxes - Church	\$0.00	\$116.13
1-100101	General Checking I	\$0.00	\$1,596.02
1-500418	Administrator Salary	\$2,037.50	\$0.00
1-500414	Auto Allow. Administrator	\$100.00	\$0.00
1-500416	Pension Plan-Administrator	\$50.00	\$0.00
1-500308	FICA - Church	\$132.53	\$0.00
1-500318	Medicare - Church	\$30.99	\$0.00

4

Cryptoassets, Blockchain and Agribusiness

*The computer program sets the parameters pursuant to which “cryptoassets” are created, with each cryptoasset being nothing more than a string of digitized numbers.

*Every computer in the network is automatically sent information about proposed transactions, which are grouped into blocks. Only transactions that are permissible under the terms of the program are added into a possible block—so no sales from people without a sufficient amount of the asset in their account.

*every block of potential transactions has a unique identifier

5

Cryptoassets, Blockchain and Agribusiness

*At the end of every unique block is a complicated algorithmic problem that is very hard to solve. When the program relies on proof of work (PoW), computers that work on solving the problem are said to be mining, because if they solve the problem first, they are rewarded with tokens.

*NOTE: There are other consensus protocols, and not every cryptoasset is mined. Many are “pre-mined,” and persons acquire tokens only by buying them from the creator or other sellers. To reduce the energy costs associated with all those computers working on PoW, some blockchains use Proof of Stake protocols (PoS)

6

Cryptoassets, Blockchain and Agribusiness

*Once discovered, the correct solution for a particular block is broadcast to the network, where other computers validate it in accordance with the programming protocols, and that particular block (with its unique identifier) is then added to a chain of transactions.

*The first transaction is the genesis transaction for that block (awarding the tokens to the successful miner).

*Together, the chain of blocks (the blockchain) works like a digital ledger recording all prior transactions in the asset governed by that program.

7

What kinds of cryptoassets are there?

- Tokens designed to work like money, generally called **cryptocurrencies** (starting with Bitcoin and then various “altcoins” like Litecoin, Dash, Zcoin, Monero)

In Blockchain 2.0, companies created new cryptoassets, generally referred to as “**utility tokens**” (tokens with some other function other than serving as a replacement for fiat currency)

- Tokens that demonstrate ownership in a share of an underlying commodity (gold—Digix Gold Token; petroleum—Venezuela’s Petro)
- Tokens that document membership
- Tokens that attach to specific items to allow tracing of location or condition

8

Part 2-Who regulates cryptoassets?



9

The IRS

- *crypto is property, and every transaction involving it is treated like barter
- *any gain on exchange is taxable
- *beware of volatility in price
- *strict record-keeping requirements (which can be satisfied by services like BitPay)



10

FinCEN (under the BSA)

- *regulates money services businesses
- *focused on money-laundering
- *registration, reporting, record-keeping, AML & KYC requirements



11

The SEC

- *regulates sales of securities (requiring registration or an exemption)
- *investment contracts are securities
- *SEC also investigates fraud



12

The CFTC

- *treats anything of value as a commodity, and regulates it if the asset class has futures traded in it
- *there are bitcoin futures, so crypto is a commodity
- *regulates fraud in the spot (aka physical) markets



13

Other regulators

- OFAC, FTC, CFPB at the federal level
- State regulators (money transmitter and securities regulation in particular)
- Remember the international scope of blockchain operations, which may also bring the law of other nations into play (for example, Binance- which is technically domiciled in the Cayman Islands- is currently being investigated, sued, or under orders regarding its activity in U.S., Britain, Japan, Germany, Singapore, Hong Kong).

14

Part 3—Applications for Agribusinesses



15

The kinds of crypto and blockchain applications that might be useful to agribusinesses

- Financial Applications
- Supply Chain Applications
- Commerce and Customer Relations
- Energy and Environmental Applications

16

Financial Applications

- Applications to facilitate the receipt of payments in cryptoassets (example, BitPay)
- Specific applications geared at geographic areas (BitPesa in Africa, HUPAYX in South Korea)
- Crypto-financial institutions that facilitate trans-national payments (Ripple and its XRP token)
- Permissioned blockchains that allow coordination between banks (we.trade in Europe; MarcoPolo in the U.S.)

17

Supply Chain Applications

- Walmart and the IBM Food Trust Supply Chain
- There are a number of platforms that offer supply chain services: Agrichain (Australia); OwlTing (Taiwan); Blockchain Food Safety Alliance (China, with Walmart and JD.com); Food Trust Framework (China, with Alibaba); OriginTrail (Europe); Ripe (US); FoodLogiQ (US)
- Others are not limited to but include agribusiness: SAP (based in Germany)
- Most of these are permissioned blockchains set up to track items as they move from one place (farm) to store or table, reliant on external sources (called Oracles) to provide information

18

Commerce and Customer Relations

- Many companies focusing on supply chains also include the potential to improve customer confidence, marketing efforts
- Other companies have specific functions to assist in commercialization, such as Agrichain having options to improve contracting and broker integration for farms and ranches; Arc-Net offering consumers access to a detailed record (storybook) about a product's origin and history
- Blockchain offers ways to improve efficiency, transparency, security of records, safety, authenticity of products

19

Energy/Environmental Applications

- Can use blockchain data to improve efficiency of operations, decreasing water waste, over-use of pesticides or fertilizer, etc.
- Beefchain provides blockchain-based monitoring and verification for certification of free-range, grass-fed cattle
- Solarcoin creates new possibilities for energy and water trading and for incentivizing energy efficient alternatives, with the cryptoasset currently being used as a reward for solar installation.

20

Energy/Environmental Applications - NORI

- Suppose a farming/ranching operation decides to investigate carbon sequestration options for environmental reasons, PR/customer relations, or the potential to sell carbon offsets
- How to go about documenting such offsets and finding a buyer?
- NORI facilitates these transactions
- It connects with the rancher/farmer, uses third party verification tools (“oracles”) to ensure removal of a tonne of CO₂ (with contractual commitment to continue sequestration practices for 10 years), then “buys” that for 1 Nori token

21

Energy/Environmental Applications - NORI

- The Nori Token is hosted on the Ethereum blockchain, which allows for free-market pricing to establish the value of the sequestered carbon, either to industry or environmentalists
- Nori’s model assures buyers that 1 NORI always purchases 1 tonne of CO₂ stored for at least ten years
- When the token is bought from the farmer/rancher it is cancelled, which prevents it from being resold (avoiding the troubling double-spend issue)

22

Energy/Environmental Applications - NORI

- The agribusiness does not have to find a direct buyer for any carbon offsets; they place their Nori tokens for sale on Nori.com. The farming/ranching operation can hold the tokens and sell when they choose.
- Nori takes 15% of the proceeds from the sale of a token as a transaction fee to help run the marketplace.
- At the current time they are only working with farms in the U.S., and that is apparently still on a limited basis.

23

Conclusion

- *There are a wide range of blockchain and cryptoasset applications that could be used to assist agribusiness operations
- *There are an even larger group of considerations before any such use is adopted, including what regulators are involved, the tax implications, and deciding which cryptoasset, company or application to rely on

24

Additional Resources:

Blockchain and Bitcoin Basics: Applicability to Agriculture (Goforth; 2021)

Creating and Using Cryptoassets: Regulatory Implications (Goforth; 2021)

Blockchain Initiatives and Operations Focusing on Agriculture (Goforth; 2021)

All three papers available for download at

<https://nationalaglawcenter.org/center-publications/financeandcredit/#cryptobasics>

Let's turn to some questions...

