

The Role of Block Chain in Real Estate Records

Presentation for Michigan Land and Title Association

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Topics Covered Today

- Block Chain Explained
- Computers in a Network
- Primer on Crypto Currencies (Bitcoins) *What are They?*
- Advantages of Block Chain for Land Administration
- Block Chain - a Revolution in Technology
- Legislative Action and Pilot Projects
- Block Chain Criticism

Definitions for our Discussions today

- **Cadastre** (ca-da-ster) - Comprehensive land recording of the real estate value and/or real property's metes-and-bounds of a country for taxation purposes
- **Database** – Large collection of data organized for rapid search and retrieval
- **FIG Commissions** - International Federation of Surveyors
- **(API)** - Application Programming Interface - a set of routine protocols and tools that allow the exchange of documents
- **Malware** - Includes viruses, spyware, and other unwanted software that can cause your device to crash, and can be used to monitor and control your online activity
- **Quantum Computing** - Works with particles that can be in superposition. Rather than representing bits — they represent qubits, which can take on the value 0, or 1, or both simultaneously



Block Chain explained

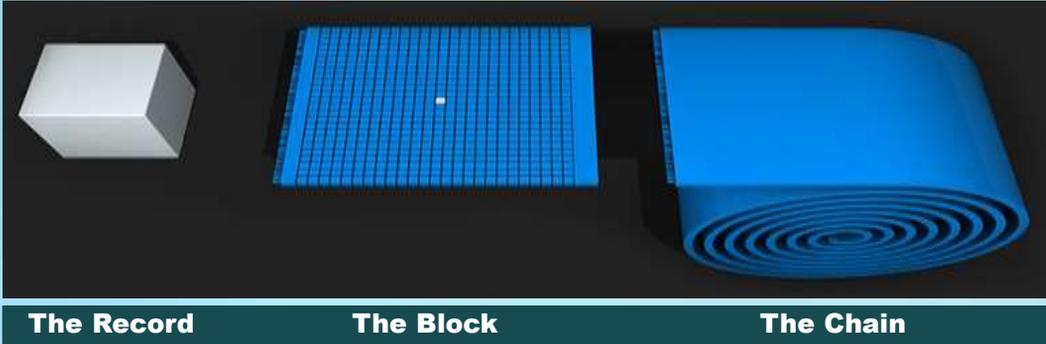
MARYANNE MURRAY

June 15, 2018

- A block chain is a database
- It is shared across a network of computers
- Once a record has been added to the chain it is very difficult to change
- To ensure all the copies of the database are the same, the network makes constant checks
- Block chains underpin cyber-currencies like Bitcoin, but many other possible uses are emerging

A Database

Records are bundled together in blocks and added to the chain one after another



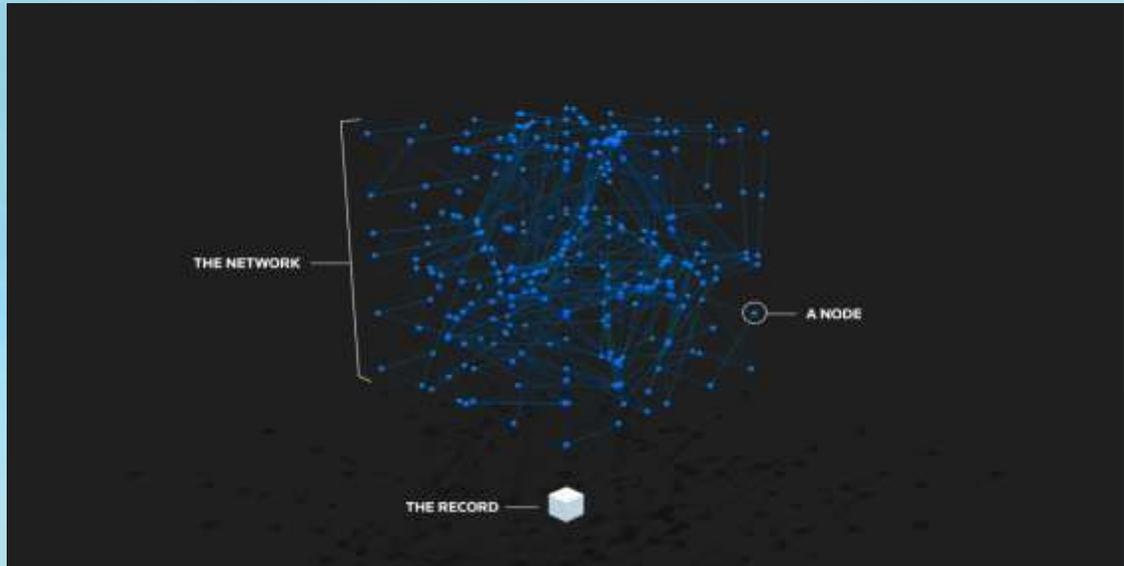
A trade is recorded. Mr. Pink sells two coins to Mr. Green for \$100

The record holds the details of the trade includes a digital signature from each party



The record is checked by the Network

Nodes check the details of the trade to make sure it is valid



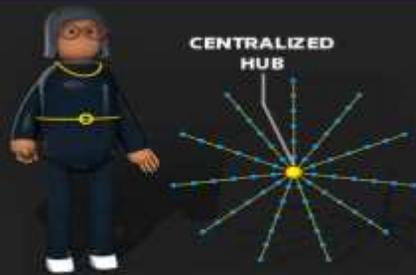
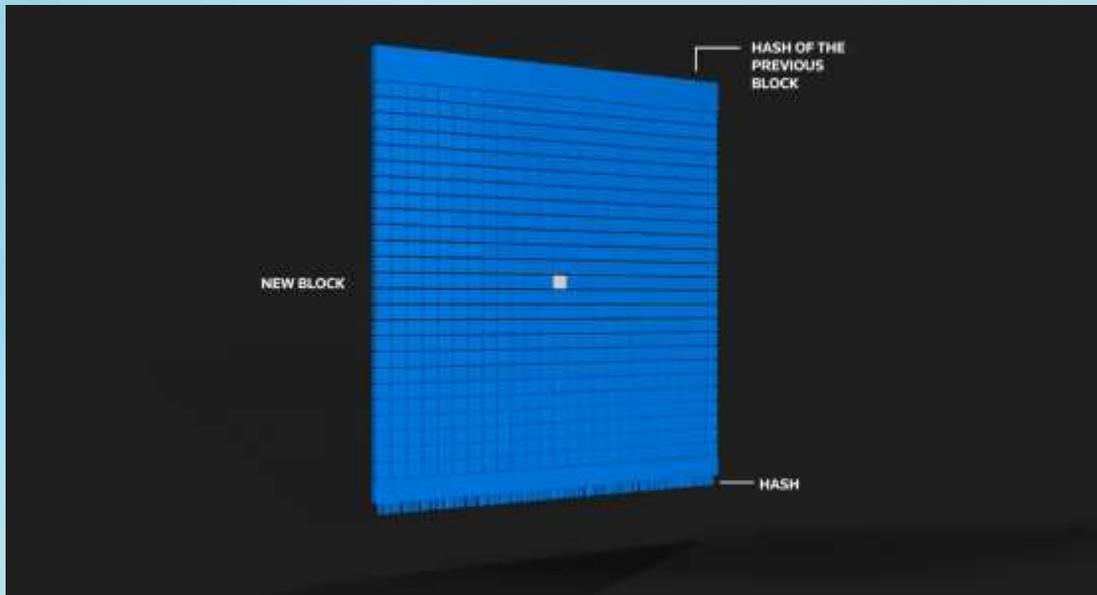
Records accepted are added to a block

Each block contains a unique code called a 'hash' and the hash of the block before it



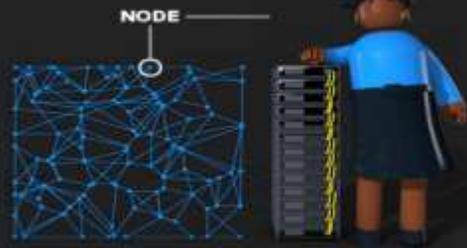
The block is added to the blockchain

The hash codes connect to the blocks together in order



CENTRALIZED NETWORK

Authority is held by a central node.



DECENTRALIZED NETWORK

All the nodes can access the information and compete to be the next to add to the database.

Permission to join

Without centralized control of a network, trust is a problem. One answer is to only let people you know, such as company employees, join in. But blockchains such as the bitcoin network are open to anyone. Members are anonymous. There is no way to know if they are trustworthy.

To resolve this and build trust, these blockchains set tests for the computers that seek to join and add records to the chain. The tests are called consensus models.

Primer on Crypto Currency



Crypto Currency



As of
04/10/2018
1565 different
Coins



- Bitcoin is traded over and administered by a distributed network of nodes connected via the internet. Anyone wishing to buy or sell Bitcoin must first become a node on this distributed network
- This is done by downloading a peer-to-peer networking application known as a Wallet.

August 2015

How Does Bitcoin Work?

- The Wallet software generates private and public keys used to digitally sign your transactions.
- The Wallet software initially downloads, and then continually syncs with, the Blockchain. This is the definitive record of every transaction in the history of the Bitcoin cryptocurrency



Wallet Software

- To make a Bitcoin transaction a user must broadcast the details of the transaction to the network using their Wallet application. The transaction is signed digitally and contains the unique key of both parties
- Specialist nodes called “miners” collect transactions together into a bundle called a “block”. Miners validate the transactions, complete a ‘proof of work’; a computationally difficult, but easily verifiable, calculation.
- The first miner to complete the proof of work (as verified by the other nodes) adds their block of transactions to The Block chain and receives a reward plus any additional transaction fees



Block Chain Technology

- The block chain can be an electronic digital auditing system in the cloud. Aside from Bitcoin and other cryptocurrencies
- Block chain technology creates a virtual cadastre-in-the-cloud in which property records will be maintained and accessible from any location with perfect accuracy and security
- Several International Federation of Surveyors (FIG) commissions have added blockchain to their areas of study in 2017

As of July11, 2018

Cryptocurrencies -		Watchlist		USD +		-- Back to Top 100			
#	Name	Symbol	Market Cap	Price	Circulating Supply	Volume (24h)	% 1h	% 24h	% 7d
1	Bitcoin	BTC	\$110,248,358,719	\$6,430.93	17,143,612	\$3,750,270,000	0.09%	0.43%	-3.42%
2	Ethereum	ETH	\$44,773,287,491	\$444.90	100,624,983	\$1,456,900,000	0.00%	0.90%	-5.93%
3	XRP	XRP	\$17,667,825,286	\$0.449993	39,262,444,717 *	\$193,285,000	0.03%	-0.05%	-6.50%
4	Bitcoin Cash	BCH	\$12,028,828,769	\$695.07	17,231,625	\$323,258,000	-0.24%	-0.12%	-10.02%
5	EOS	EOS	\$6,376,856,402	\$7.12	896,149,492 *	\$625,568,000	-0.11%	-2.81%	-21.51%
6	Litecoin	LTC	\$4,512,324,530	\$78.67	57,357,400	\$309,528,000	-0.08%	3.00%	-9.35%
7	Stellar	XLM	\$3,566,740,372	\$0.190064	18,765,996,567 *	\$36,440,400	-0.32%	-2.49%	-10.22%
8	Cardano	ADA	\$3,405,054,028	\$0.131332	25,927,070,538 *	\$52,428,900	-0.89%	0.31%	-15.15%
9	IOTA	MIOTA	\$2,745,828,478	\$0.987875	2,779,530,283 *	\$41,164,600	-0.36%	1.10%	-18.33%
10	Tether	USDT	\$2,630,578,557	\$1.01	2,607,140,346 *	\$2,019,380,000	0.12%	0.63%	-0.88%

Bitcoin (USD) Price

Closing Price OHLC

1h 12h 1d 1w 1m 3m 1y All

Apr 2, 2018 to Jul 2, 2018 Export

**\$6,639.46** ▲ 4.59%

Today's Open	\$6,347.86	Change	▲ \$291.61
Today's High	\$6,661.76	Market Cap	\$0.114T
Today's Low	\$6,278.94	Supply	17,127,825



Cryptocurrency Boom

- The prices of Bitcoin rose more than 1,500 percent. Most gains occurred during the last few months of the year, High prices caused many traders to sell in 2017 to lock in profits. But instead of Cash, many bought new Cryptocurrencies. Most of these have lost money in the 2018 slump
- Many investors are now short on the funds needed to pay the taxes for last year



Crypto Coin Tax Implications...

Because Uncle Sam is entitled to a portion of your Cryptocurrency gains!

The Advantages of Block chain for Land Administration

- Existing land information systems are typically centralized ledgers containing land transaction records.
- *Works well* -- underpin the value of the country's land assets by guaranteeing title or title insurance.
- *Dysfunctional?* -- inhibit economic growth by reducing security, provoking ownership disputes and concealing corruption
- Blockchain land registry would have the same function (and potential problems and benefits) as a traditional land registry, but with **one key difference, the ledger (the record of the nation's land transactions) would be decentralized.** This could have a number of advantages over a centralized system

Advantages over a Centralized System

- **Resilience:** every node on the network would have a full copy of the ledger. **Redundancy would make the registry almost indestructible**
- **Trust:** land registries trade on trust. **Blockchain is effectively immutable.** Most centralized land registries also cannot be altered without due process and a fully documented audit trail, but there have been cases of countries with weak institutions where corrupt and powerful interests have used influence to disrupt due process
- **Transparency:** every transaction is in the open for anyone to see. Every node on the network has all the information they need for an audit of every transaction. However **for full auditability there would need to be a mechanism for identifying the parties involved in the transactions, currently this is not possible with Bitcoin**

Advantages Cont.

- **Efficiency:** by removing third parties you can theoretically increase the efficiency of the system
- **Automation:** property transactions often rely on chains, a buyer needs to sell their property before they can buy and so on. It would be possible to automate such chains with a transaction being programmed to proceed once a defined transaction appears as complete in The Blockchain - **Smart contracts**

Block Chain is a Revolution in Technology that will Touch all People and all Businesses



Mark Zilbert, Forbes
Real Estate Council

Real Estate And The Block Chain

The block chain has the potential to change the way we do Real Estate business.

We are developing smart contracts, which will enable real estate contracts, escrows, property records (e.g., deeds) to be completed and monies distributed without title companies or attorneys.

In the near future, it may be possible for a homebuyer to buy a home and complete the sale (along with escrow and title insurance) by clicking on a shopping cart on a website.

The block chain will ensure that the buyer gets the title or deed and the seller gets the cash (via a cryptocurrency).

The block chain will also record the title or deed to the appropriate public records, such as a county in the United States or similar.



Real estate professionals will continue to thrive in the block chain era. The advice, knowledge and hand-holding of real estate professionals will always be an important part of a buyer or seller's process.

However, the handling of money and transactions will inevitably change, and that change is already underway. Brokerages will need to adapt their business models to understand and enable smart transactions but otherwise will continue to thrive in the era of the block chain.



Forbes Real Estate Council

Legislative Action on Electronic Notarization

- Michigan Bill introduced by Sen. Peter MacGregor, Geoff Hansen [SB 664](#), which would allow electronic notarization of documents to occur has passed both houses 6/5/2018
- Bill will allow e-notarization to occur, but it will not require e-notarization
- SB999 amends the uniform Real Property Electronic Recording Act- Permits County R of D to accept electronic documents for recording
- Mortgage and real estate agencies are two Michigan groups that support and are actively working on SB 664, 996,997,998,999



Canada

- Kelly (Toronto, Ward 40 Scarborough-Agincourt) wants the city to study whether Toronto residents should be able to use cryptocurrency, to pay bills such as property taxes, parking tickets and land transfer taxes



Trading at \$0.050463
1.62% of a dollar

July 11, 2018

Blox Labs (Toronto-based)

- Focused on creating the best-in-class solutions using Block Chain, smart contracts and decentralized apps – Positioned itself to be a major player in Canada's legal cannabis industry
- Last month Canada legalized possession, home growing, and sales of marijuana for adults. Takes effect in 10/2018
- In this law comes increased pressure to regulate the industry in both Medicinal and recreational cannabis
- CannaBlox – (Blox and Liberty Leaf Holdings) have developed a blockchain-based smart contract supply chain management platform that provides the management of the flow of goods, services, movement, storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption

Buy Houses with Bitcoin In California, Where Bitcoin Is “Legal Tender”

- The company is called Tax Lien Ventures, and they are taking full advantage of the [recent law](#) passed in the [State of California](#)
- The new law grants Bitcoin as a fully “legal tender” currency, and thus allows the common owner of Bitcoin to invest in tax lien certificates



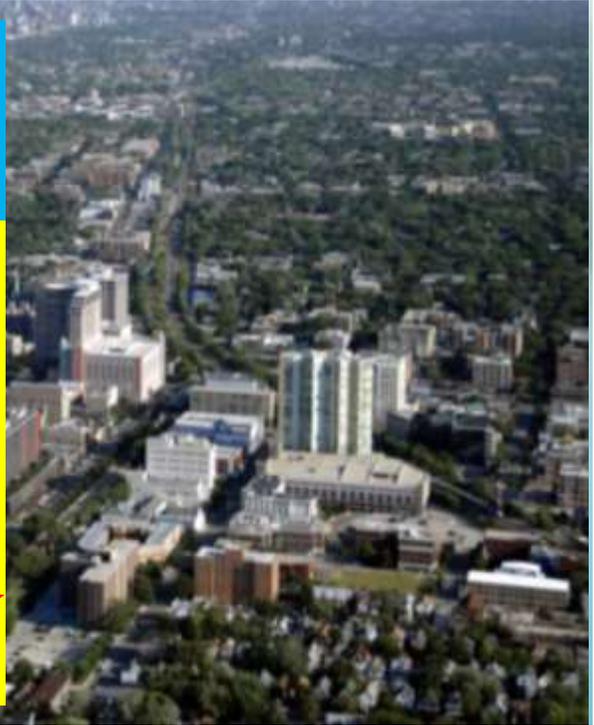
Block Chain Technology Applied to Land Administration



- **Factom**, appointed by the government of **Honduras** to apply Bitcoin technology to its land registry has developed a technology that inserts references to data stored within its own peer-to-peer network into the Bitcoin Block chain. The references are inserted using Bitcoin’s protocol, that **allows users to insert up to 40 bytes of data into any transaction**
- The system will be a method of recording deed transaction and will only provide a record that the transaction has occurred. **The system will not attempted to validate the transaction.** This is analogous to a registry of deeds, or title registry

Cook County Recorder of Deeds (CCRD) Releases Block chain **Pilot** Final Report

- Pilot started in September 2016
- Goal was to study how Block chain Technology could be implemented in current law and practice in Illinois land records
- Pilot produced a series of findings and results
- Result 1: *The participants designed a block chain real estate conveyance software workflow that can be a framework for the first legal block chain conveyance in Illinois (and possibly the US.)*



Block Chain **Pilot**

- Result 2: *CCRD has successfully used components of blockchain technology to secure government records*
- Result 3: *CCRD built the most informative property information website in Cook County, with a dedicated landing page for each parcel.*
- Result 4: *CCRD's current vendor, Conduent (formerly Xerox/ACS) has agreed to incorporate some of the technology used in blockchains, particularly file hashing and data integrity certification, into the new land records system currently being installed.*



Summary of CCRD's Findings and Opinions

1. **Block chain** technology is a known method for permanently storing transactional records that in a number of respects **is superior to locally-isolated client-server models**, and can provide a method of recordkeeping that is resistant to alteration, even by government officials
2. The use of **Block chain with a Proof of Work consensus algorithm that requires expending massive amounts of electricity to confirm each transaction is not ideal for real estate recordkeeping**. Distributed ledgers may be a better option
3. **Block chain** can provide a mechanism to **combine the act of conveyance and the act of providing notice (recordation) of the conveyance into one event**



4. **Block chain is not an all-or-nothing approach**; aspects of the component technology can be implemented individually or selectively to improve recordkeeping outcomes

7. While **digital signatures could phase out “wet” signatures** from the public record and could thereby increase privacy and security, **it could enable secrecy, and it remains important for Illinois’ land registry to remain open and continue to identify all who participate**



10. With the CCRD office slated for consolidation with the Cook County Clerk by 2020, **it is not prudent to undertake any large conversion effort without knowing the commitment of the elected official who will ultimately run the combined office**



Block Chain a European Prospective for Land Records?

- Many of the benefits listed above are also benefits of any digital land registry, not exclusive to The Block chain.
- The UK Land Registry experimented with exactly this type of system over five years ago but shelved it citing a lack of interest^[15]. “Digital Street”
- **Rarely is it the technology at fault**, more often it is tricky real world issues, such as correctly identifying the initial rights holder and documenting the geographic boundary of a claim
- **Block chain is seldom, or never, a solution in itself but can be used as a building block.** (Jasper van Gelder)



The potential for the Real Estate Industry

By **Stephanie Bentley**
after taking with experts
at Deloitte

- “For the real estate industry, we envision a Federated Real Estate Data network (FRED)
- FRED envisions a federated, distributed network for exchanging real estate information between FRED administrative systems
- FRED members all contain their own information and communicate directly with each other via an application programming interface (API) that allows them to exchange documents”

Potential

- FRED, one **single source of truth** for the location, size, cashflow, quality, state of maintenance, occupancy and contracts of commercial real estate assets is created with accessibility for each relevant stakeholder during the life cycle of a building
- We believe **Block chain will deliver a positive contribution** to the world of real estate, in terms of uniformity, efficiency, and transparency. (Jan-Willem Santing)
- Due to innovative technologies such as block chain, **data driven real estate management is on its way and with it, radical changes to the role of real estate professionals**

The Swedish Experiment

- June 2017 Lantmateriet says it could save \$106 million a year through elimination of Paperwork, reducing fraud, and speeding up transactions (Kairos Future)
- Phase II began March 31, 2018 with the phone company and two Swedish banks
- They are creating smart contracts to automate transactions on the Block chain
- Operates on a private Block chain held by the land authority and banks holding the records. This stops short of a full-blown Cryptocurrency transaction. Legal obstacles with the validity of digital signatures need to be resolved. Earliest date deployed, if ever is 2019

Block Chain for U.S. State and Local Government - Updates

Virginia also is trying ahead of the curve with blockchain. In June, Virginia Gov. Terry McAuliffe pledged nearly \$50,000 in funding to SynaptiCAD for the commercialization of block chain technologies

Delaware September 2017, now allows companies to use block chain technology to issue and track stocks—the first state in the nation to do so

Nevada became the first state to ban local governments from taxing block chain use “If a law requires a record to be in writing, submission of a block chain which electronically contains the record satisfies the law.”

Other State Government Updates

Arizona has a new law that recognizes blockchain signatures and smart contracts. Specifically, **the law says signatures recording on blockchain are “considered to be in an electronic format and to be an electronic record.”**

Illinois August, 2017, announced a pilot project to [create “secure ‘self-sovereign’ identity”](#) for Illinois citizens wishing to access their birth certificate. The idea is to use a blockchain-like distributed ledger that allows online access only to the people owning the ID, and any third parties granted their permission

Illinois is [working with software firm Evernym](#) of Herriman, Utah, to create a record of who should be able to access data from the state’s birth register. Once this is done, [no central authority should be required](#), just your say-so

The Good and the Bad!

- Heavy criticism has to do with the vast amounts of energy necessary to process and store transactions, especially as the use of block chain technology increases
- The Bitcoin block chain network's miners **are attempting 450 thousand trillion solutions per second** in efforts to validate transactions, using substantial amounts of computer power
- Wasted resources: **Mining Bitcoin wastes huge amounts of energy (\$15million/day)**

Deloitte's Blockchain technology: 9 benefits & 7 challenges,

<https://www2.deloitte.com/nl/nl/pages/innovatie/artikelen/blockchain-technology-9-benefits-and-7-challenges.html>

Blockchain in the Energy Sector: Institutional Disruption? By Marius Buchmann

<http://www.theenergycollective.com/enerquire/2402120/blockchain-energy-sector-institutional-disruption>

- **2017 - Quantum computing and block chain technology**
– This may be the beginning of something big - like the advent of GPS
- The challenge of dealing with the Big Data produced by "the internet of things" is thousands of sensors will collect millions of bits of data for municipal administration over everything from traffic control to voting patterns,...
- **Only the processing abilities of Quantum computing, will be able to handle the information overload. Quantum computer is 100 million times faster than your current laptop**



Block Chain Land Record Watch List

- **Ubitquity** – Advocates a platform that serves as a complete electronic health record of the property – deed of trust, mortgage notes, but also surveys, flood elevation certificates, major structural warranties, and ...
- **ChromaWay** – A Swedish Co. Using the name of Vizag running a pilot putting land records on a block chain in the state of Andhra Pradesh, India
- **Russia** – Government trial tests began July 1, 2018 also included are the Tax Service, Cadaster and Cartography, and Federal Service for State Registration
- **Ukraine** – 70% of land value lost since 2008. Will now allow foreign land ownership. 25% of Agricultural owned by the State. Block chain will be used for auctions of leases of State property

Questions

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