



Blockchain and Smart Contracts: From Supply Chain to Payment

**American Agricultural Law Association
2020 Annual Symposium**

November 13, 2020

Michael K. Bydalek | Jason M. Caskey

KUTAKROCK

kutakrock.com

Speakers



Michael K. Bydalek

Partner

michael.bydalek@kutakrock.com



Jason M. Caskey

Partner

jason.caskey@kutakrock.com

Technology – Blockchain



Technology – Blockchain

- New technology, old concept
 - Over 1,500 years ago, the Yapese people utilized giant stones to create a community ledger system used to facilitate financial transactions
 - Stuart Haber and W. Scott Stornetta develop the first cryptographically secured chain of blocks in 1991
 - ‘Satoshi Nakamoto’ is the pseudonym used by the creator of blockchain in 2008
- Key Tenets of Blockchain
 - Decentralization and Portability
 - Anonymity and Privacy
 - Trust and Confidence

Technology – Blockchain, cont.

- The mechanics of blockchain:
 - A distributed ledger that keeps track of transactions and is duplicated across a number of computers (or nodes) to create a network
 - A transaction must be validated by consensus in order to be recorded on the ledger
 - Predefined protocols provide a governance structure for each blockchain which can define how consensus is achieved, the rules of the blockchain, and membership obligations
- Public versus Permissioned blockchain

Technology – Smart Contracts

Technology – Smart Contracts

- A digital tool that automatically executes transactions and records them across a distributed, decentralized blockchain network when certain conditions are met
- Terms of an agreement are expressed as lines of computer code
- Contracts can be executed automatically, without human intervention
- Smart contracts render transactions traceable, transparent, and irreversible
- Reliance on the “If-Then” principle promotes trust in transactions

Technology – Smart Contracts, cont.

- Smart contracts can provide escrow services
- Examples of use cases:
 - Insurance (insured loss → payment)
 - Credit default swaps (creditor's default → payment of funds)
 - Transportation rental (payment → unlocking of bike)
- Key Tenants of smart contracts
 - Autonomy
 - Trust
 - Saving
 - Safety
 - Efficiency



Connected Supply Chain Management

- Effective supply chain management
 - Visibility, aggregation, validation, automation, resiliency
- Capital investment required throughout the supply chain
 - Bar-codes, RFID, and other IoT devices enables data acquisition
- Smart contracts can be automatically programmed to impose penalties or benefits on parties involved in the supply chain for violating or exceeding predefined requirements
 - Farmer (specialty production method used → premium sale)
 - Logistics (produce shipped at incorrect temperature → discount)
- Walmart 2016 Hyperledger blockchain examples
 - Chinese pork supply chains
 - U.S. mango supply chains



Data Rights



- Sell what you grow, now sell what data you collect
 - Operational and performance analysis (Ag Chem)
 - Information exchange (Procedures)
 - Contractual sale of data (Wholesale markets)
- Smart contracts utilizing blockchain technology can ensure:
 - Secured transfer of rights between parties (local and global implications)
- Fraud prevention
 - Data entries and changes to the blockchain can be validated by a group
- Effective data collection remains dependent upon available wireless connections across the U.S. for IoT devices
 - Bridging the 'digital divide' can facilitate cost-efficient precision driven farming practices



Commercialization of Data

- Blockchain data can provide an immutable record detailing production-factors from provenance to retail store for an individual product
 - Increase trust between consumers and procedures
 - Certification for organic and other specialty production
- Italian pasta producer, Barilla, utilized blockchain technology to address transparency and traceability issues for pesto production
- Precision Farming and Resource Management
 - Global IoT devices provide growers with precise irrigation plans based on rainfall, custom fertilization based on changes to soil quality, pest control measures responding to diseases or outbreaks
 - Real-time monitoring of equipment and machinery can reduce downtime



Traceability of Components

- Data fragmentation and centralized controls perpetuates issues of effective traceability practices
- Food Safety Modernization Act 2011 permits USDA to enforce mandatory recall and record keeping requirements for designated high-risk foods
- Certain non-exempt entities governed by the Public Health Security and Bioterrorism Preparedness and Response Act 2002 (“Bioterrorism Act”) requires “one-step-forward and one-step-back” accountability for various food products
 - Traceability and additional record keeping requirements
- Various state laws can require produce boxes to identify the commodity, variety, responsible party (entity, town, state), and quantity (weight, count, size, quality grade)

Payments and Cryptocurrency



- Blockchain provides a secure digital payment solution
 - No intermediary to facilitate transactions (peer-to-peer payments)
 - Reduction in transaction costs
- Various types of cryptocurrencies
 - Bitcoin
 - Altcoins, including “Asset-Backed Coins”, or “Stable Coins”
 - Tokens
- U.S. Regulatory Tower of Babel
 - SEC, CFTC, IRS, U.S. Dept. of Treasury (FinCEN)

Data Privacy Considerations

- Blockchains and smart contracts which utilize ‘personal information’ as a method to record ownership or other assigned rights may be subject to burdensome privacy laws
- Common tensions between blockchains and privacy laws:
 - International data transfers
 - Application of individual data rights (access, rectification, deletion)
- The United States:
 - Patchwork approach to privacy and data security law
- European Union:
 - General Data Protection Regulation (“GDPR”)



Thank You



Michael K. Bydalek

Partner

michael.bydalek@kutakrock.com



Jason M. Caskey

Partner

jason.caskey@kutakrock.com