



# **Blockchain in Cannabis: Boosting Market Efficiency**

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# Agenda

- \* Sherree DeCovny will give a 20-minute overview of the cannabis supply chain from an informed observer's perspective.
- \* Jess Jessop, CEO of California Cannabis Market, will talk about his customers' needs and provide a technologist's perspective.
- \* 10-15 minutes for Q&A



# My personal blockchain journey

# Overview Outline

- \* Supply chain for beginners
- \* The cannabis supply chain
- \* Inefficiencies in the cannabis supply chain
- \* The role of technology in supply chain management
- \* Technology in the cannabis supply chain
- \* An imperfect world
- \* Blockchain and its potential role in cannabis
- \* Current blockchain-based offerings



# What is supply chain?

- \* All stages product life cycle (sourcing, manufacturing, delivery, product returns)
- \* A strategic asset and source of competitive advantage
- \* Getting the right product to the right place at the right time in the right quantity and at the right price
- \* Speed, agility, efficiency, responsiveness, resiliency, innovation and the ability to deliver predictable results
- \* High-performers: Share info, use advanced planning & predictive tools, manage risk
- \* Poor-performers: Disruptions destroy shareholder value



# The cannabis supply chain

- \* Growers: cultivate plants from seed
- \* Distributors: fulfillment, sales, storage and transportation
- \* Testing laboratories: attributes and hazardous substances
- \* Manufacturers: raw material to consumable products
- \* Dispensaries: retail stores for products & accessories
- \* End customers: medical &/or recreational



# Other key stakeholders

- \* Regulators
- \* Financial service providers
- \* Importers and exporters
- \* Tax collectors
- \* Healthcare professionals
- \* Product, service and technology providers

# Inefficiencies in the cannabis supply chain



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SUPPLY CHAINS REIMAGINED

- \* Regulation has led to fragmentation
- \* Fragmentation has caused price variances and supply/demand imbalances
- \* Logistics and distribution challenges
- \* Limited access to financial services
- \* Weakness in consumer safety
- \* Lack of industry standards





# Technology in supply chain management

- \* Technology is key enabler of operational efficiency
- \* Recent move toward digitalization and digital transformation
- \* Leading companies experimenting with internet of things (IoT) devices, machine learning (ML), artificial intelligence (AI) and linking those to a blockchain



# Technology in the cannabis supply chain

- \* Regulators require cannabis to be tracked from seed to sale
- \* Efficiencies already being gained through use of barcoding, quick response (QR) codes, radio frequency identification (RFID) chips as well as IoT devices, such as sensors
- \* Three chain of custody systems dominate landscape

# Metrc

- \* Developed by Franwell
- \* Leverages RFID technology and serialized item tracking
- \* End-to-end surveillance and real-time visibility
- \* Used in Alaska, California, Colorado, the District of Columbia, Louisiana, Maryland, Massachusetts, Michigan, Montana, Nevada, Ohio and Oregon; Maine recently signed deal
- \* Registered over 20,000 users and tracked more than 5 million plants and 3.8 million packages

# MJ Freeway

- \* “ERP for the cannabis industry”
- \* Domestic clients in 29 states and DC
- \* International clients in Australia, Canada, Chile, Colombia, Denmark, New Zealand, South Africa, Spain, Switzerland and Uruguay
- \* Leaf Data Systems (regulators); MJ Platform (business)
- \* Processed more than \$13 billion in medicinal and recreational cannabis sales

# BioTrackTHC

- \* Originally tracked prescription drugs and methamphetamines
- \* Plants or clones issued a 16-digit identifier
- \* Batched material issued another 16-digit identifier
- \* Patients assigned unique ID for validating their information and sales limitations in real time
- \* Amazon Government Cloud
- \* Used by New Mexico, Illinois, New York, Hawaii, City of Arcata in California, Delaware, Arkansas, North Dakota and Puerto Rico

# Great start but glitches can occur

- \* Problems reported in WA, IL, MD and MA
- \* One system hacked and source code stolen
- \* Processes have been driven to paper during transitions
- \* Complaints about mixed up shipping orders, causing delays and supply issues
- \* Third-party inventory management software created discrepancies with strain names, product types and stock tracking
- \* Systems running slowly so had to resort to manual input



# What is blockchain?

- \* Type of distributed ledger or a specialized database
- \* Extremely secure, tamper-proof and immutable
- \* Blocks are cryptographically linked, timestamped and synchronized
- \* Shared ledger, updated by many participants, no central control, mutually agreed upon by consensus
- \* Can execute smart contracts
- \* Complement existing systems and conventional databases, and link to IoT devices and sensors

# Potential role for blockchain

- \* Visibility
- \* Traceability
- \* Input for predictive analytics
- \* Licensing and background checks
- \* Verifying authenticity (anti-counterfeit)



# Potential role for blockchain

- \* Ensuring resiliency and security
- \* Clinical trials and research
- \* Monitoring for environmental sustainability
- \* Facilitating international trade
- \* A platform for marketplaces



# Some blockchain-based vendor offerings

- \* **420 Blockchain:** Built on IBM's Hyperledger Fabric and leverages AI, ML and Google cloud infrastructure
- \* **BlockStrain Technology:** Registers and tracks IP; partnership with WeedMD (Canadian producer/distributor)
- \* **DMG Blockchain Solutions:** Working with IBM on global supply chain platform for cannabis



# Some blockchain-based vendor offerings

- \* **Lucid Green:** Retail part of the supply chain; leverages IoT, blockchain and tokens
- \* **MassRoots:** Public company and platform for dispensaries
- \* **Nuvus Blockchain:** Leverages blockchain, AI, IoT and sensors; developed predictive data analytics engine called CognetiX
- \* **Paragon:** Developing on Ethereum; registering ParagonCoin (PRG) tokens as a class of securities

# Conclusion

- \* Market growth linked to legal status
- \* More legalization, more normalization, more efficiency
- \* Businesses will adopt a compliance culture
- \* Cannabis will be significant revenue source for some
- \* Opportunity to build infrastructure on latest technologies
- \* Blockchain, IoT, ML and AI could be transformative
- \* Lessons for other industries



# Thank you!

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