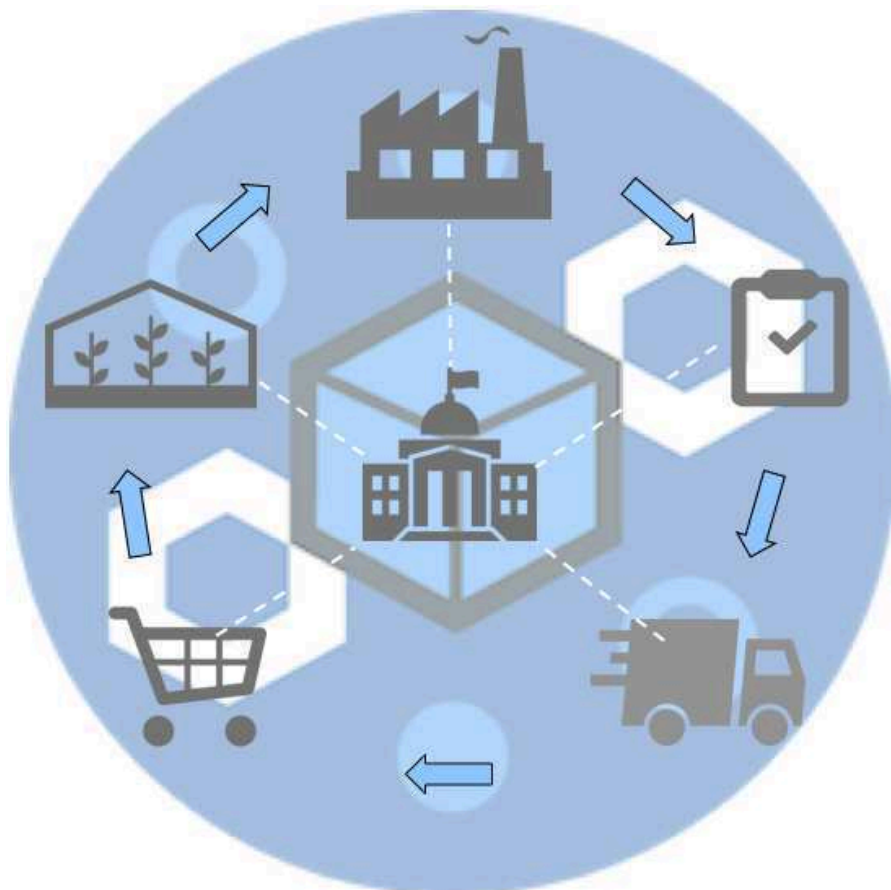




## **Hyperledger Blockchain: An Irrefutable Chain of Custody Audit for the Seed-to-Sale of Cannabis in Legalized States**

Document Date: April 1st, 2018



## Opportunity

Pacific Hyperledger welcomes the opportunity to provide feedback to states that are legalized as its regulatory framework supports its legal distribution of cannabis and cannabis by-products in their respective states. Pacific Software Inc through a working relationship with IBM has deep learnings from a wide variety of public and private supply chain implementations to leverage a variety of technologies. We will focus on the use of Blockchain as a technology to enhance the overall chain of custody.

## Advice for Consideration

Pacific Hyperledger suggests Blockchain is an ideal mechanism in which states that are legalized can transparently capture the history of cannabis through the supply chain, ensuring consumer safety while exerting regulatory control - from seed-to-sale.

Blockchain is a highly effective trust mechanism which uses a cryptographically-secure shared ledger to irrefutably track complex transactions amongst many known parties. Its key attributes:

- It is **distributed**: no central system brokers transactions, instead each party in the business network is provided its own ledger copy showing all transactions, so truth is shared by design;
- It is **immutable**: cryptography ensures that transactions (blocks) once entered into the ledger (chained) can never be altered, so transactions are secure; and
- It is **transparent**: all shared ledgers across the business network hold all transactions of all parties within the network, ensuring consensus.

Blockchain is rapidly becoming a world leading technology enabling the assured exchange of value in both digital and tangible assets, while protecting privacy and eliminating fraud. Its relevance to regulating cannabis is similar to its many chain of custody applications in areas such as pharmaceutical distribution and food chains. The core to those supply chains is the same, assuring health and safety of consumers, preventing fraud and counterfeiting while creating a foundation of transparency upon which to base regulation.

Blockchain has become one of the most disruptive technologies of this decade. Legalized states are beginning to understand the large potential benefits and realize the rate of speed and cost effectiveness in which Blockchain systems can be delivered, particularly in areas like supply chain.

- By having one set of books (distributed ledger) governments quickly see the benefits of greater visibility, which in turn leads to optimization, improved reconciliation, greater auditability and regulatory compliance.

- Consumer assurance is improved through provenance and traceability of products throughout the cannabis supply chain, and if poor product does enter the system, the controls, methods and ability to quickly identify its' path is in place.

- Complex systems design and architecture are not needed. All participants within the trusted network will have access to their own copy of the Blockchain ledger and no net new information system or complex interfaces are needed to be created as the network serves as the single source of truth.



Traceability and Visibility across the value chain

Demand for legal sourcing, speed & flexibility of supply chain drives demand for real time tracking



Fraud & Transparency

Government want to know the crop is legally grown and by whom



Redundant & Incomplete Data

Current systems based on silos, with different organizations having different or incomplete data



High Friction Enterprise Integration

Potential high volumes equates to high cash transaction, Blockchain track each transaction and keeps it simple

Blockchain further differentiates by addressing requirements for both product traceability and identity management.

The Blockchain shared ledger is updated and validated in **real time** with each network participant. This enables equal visibility of activities and reveals where an asset/product is at any point in time, who owns it and what condition or state it is in. This type of transparency would bring a new level of visibility and control to the regulators and provide assurance to the multitude of cautious stakeholders regarding the way the management of a cannabis supply chain is rolled out within legalized states.

## Value Proposition

In summary, there are a number of potential benefits for each value chain participant:



*Government:* Blockchain helps legalized states control sourcing, selling and pricing of products. This reduces or eliminates black markets completely keeping compliant with tax and regulatory issues.



*Producers:* Blockchain can assist producers with real-time inventory management, greater projections of supply and demand, and also elicit trends of consumption through data analytics.



*Retailers:* Although legalized states haven't confirmed its end user distribution model will be used, we anticipate that it is likely that government itself will play a role in that process. An interconnected Blockchain network can assist retailers identify supply/demand gaps ways to mitigate those gaps, providing feedback mechanisms to producers, and use data to create predictive insights.