**Table of Contents**

WHY BLOCKCHAIN? 02

GOALS 03

What is the client trying to achieve? 03

How do we measure that? 03

STAKEHOLDERS 04

Who is involved? 04

What are the roles that they play? 04

What are their restrictions? 04

STATE DATA 05

What is the system tracking? 05

What needs to be captured? 05

What is generated? 05

RESTRICTIONS 06

Are the restrictions role/user based? 06

Are there date/time restrictions? 06

Limitations by rules? 06

EXCEPTIONS 07

Can any of the rules be broken under certain circumstances? 07

Should any new rules be added in certain circumstances? 07

What about edge conditions? 07

REFERENCES 08

**Why blockchain now?**

A potential solution that can bring together different parties that have not directly established trust-relationships with one another, through the transparency it provides and its tamper-evident nature.

‘You see what I see’ from a data perspective, blockchain can help eliminate complex and costly data reconciliation required by most systems in the world today.

CHALLENGE 1 Coordinating across multiple, disbursed and often disconnected supply chain actors.

CHALLENGE 2 Onerous and costly data reconciliation processes

CHALLENGE 3 Lack of product traceability

VALUE 1 Transparency and auditability

Security and trust

VALUE 6 Trade finance, insurance premiums and liquidity

**Problem statement**

* Traceability of perishable product like fruits and vegetables directly from harvesting phase to delivery to customers.

**Goals**

**What are we trying to achieve?**

* Lack of product traceability
* Coordination across multiple, disbursed and often disconnected supply chain actors
* Transparency and auditability

**How do we measure that?**

Measure the temperature of product since product harvesting to all logistics channel via IOT devices and all hand offs.

**Stakeholders**

**Manufacturer**: Manufacturer would be independent entity which would sell the product to seller or trader as per their requirement.

**Seller/Trader:** Seller/Trader can either be manufacturer or trader who sells the product to middlemen or to wholesaler or to direct retailer on case to case basis.

**Logistics:** This is essential part of the use case which comes in various phases starting from manufacturer to buyer with multiple entities in between. It can be with various medium such as rail, road, sea and flight.

**Buyer:** This is the independent entity who likely to buy certain amount of goods from retailer.

**What are the roles that they play?**

**Manufacturers**:

* Create quality consumer products that are safe and free from defects.

**Logistics partners:**

* Transport goods safely and maintain all required environmental conditions.
* Ensure best practices of only properly packaged goods enter the system.

**Distributers:**

* Ensure product is in excellent condition when being sold.

**Authorities (varies from country to country):**

* Audit, regulate and ensure all rules and regulations are met accurately by all parties.

**State Data**

**What is the system tracking?**

* Cryptographic Signature.

**What needs to be captured?**

* Temperature, humidity
* Location of the product

**What are their restrictions?**

**Manufacturers**:

o Maintain compliance with drug authorities when manufacturing of product under specific conditions.

**Logistics:**

o Maintain compliance with authorities when transporting COVID-19 vaccine.

o Ensure they implement the required equipment to monitor environmental conditions

(temperature)

**Distributers**:

o Maintain compliance with legal authorities when selling vaccine.

o Acquire all required licenses for selling COVID-19 vaccine

**Authorities**:

o Laws change with new governments and varies from country to country or sometimes from state to state. The new regulations must be communicated and held up effectively

* Current holder of the product.
* Date & time while hand offs

**Restrictions**

**Are there restrictions by roles/users?**

* Ensuring right temperature of vaccine by transporter all the time till it reaches to consumer.
* Hospitals meet storage requirements for their vaccine.

**Are there date/time restrictions?**

* Vaccine’s expiry date.
* Time required to transport the vaccine in batches.

**Limitations by rules?**

* Airline rules may be applicable but would be negotiated based on current pandemic situation.
* Required Ontario freight rules while transporting within towns or states.

**Exceptions**

**Can any of the rules be broken under certain circumstances?**

* Temperature can vary between -80 °C to -60°C prior to stocking vaccine but should not breach this limit.
* Should any new rules be added in certain circumstances?
* If authorities change rules of transportation, we must abide.

**What about edge conditions?**

* If our driver is an accident that damages the products, insurance may come into picture as product is precious based on current pandemic situation.

**References**

* [**https://www.accenture.com/\_acnmedia/PDF-93/Accenture-Tracing-Supply-Chain-Blockchain-Study-PoV.pdf**](https://www.accenture.com/_acnmedia/PDF-93/Accenture-Tracing-Supply-Chain-Blockchain-Study-PoV.pdf)
* [**https://www.intel.com/content/dam/www/public/us/en/documents/pdf/connected-logistics-platform-study.pdf**](https://www.intel.com/content/dam/www/public/us/en/documents/pdf/connected-logistics-platform-study.pdf)
* [**https://www.sciencedirect.com/science/article/pii/S235286481830244X**](https://www.sciencedirect.com/science/article/pii/S235286481830244X)
* [**https://www.cnbc.com/2020/11/25/challenges-pfizer-faces-distributing-covid-19-vaccine-to-the-masses-.html**](https://www.cnbc.com/2020/11/25/challenges-pfizer-faces-distributing-covid-19-vaccine-to-the-masses-.html)
* [**https://www.cbsnews.com/news/covid-vaccine-pfizer-distribution-logistical-nightmare/**](https://www.cbsnews.com/news/covid-vaccine-pfizer-distribution-logistical-nightmare/)