THE NEXT GENERATION LOGISTICS LANDSCAPE POWERED BY PHYSICAL INTERNET & BLOCKCHAIN TECHNOLOGIES

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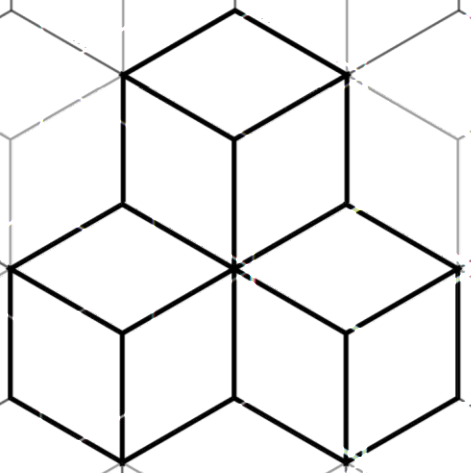
WHAT'S NEXT AFTER PFIZER / MODERNA / ASTRAZENECA



$1 billion — In vaccine purchase committed by Canada

429 million — COVID-19 doses of seven promising vaccine candidates secured domestically for Canadians

-70°C — Ultra-freezing temperature requirement for some vaccines at odds with current logistical structures

7-14 days — Strict timing for administration of vaccine once stored under conditions different from the manufacturer's recommendations

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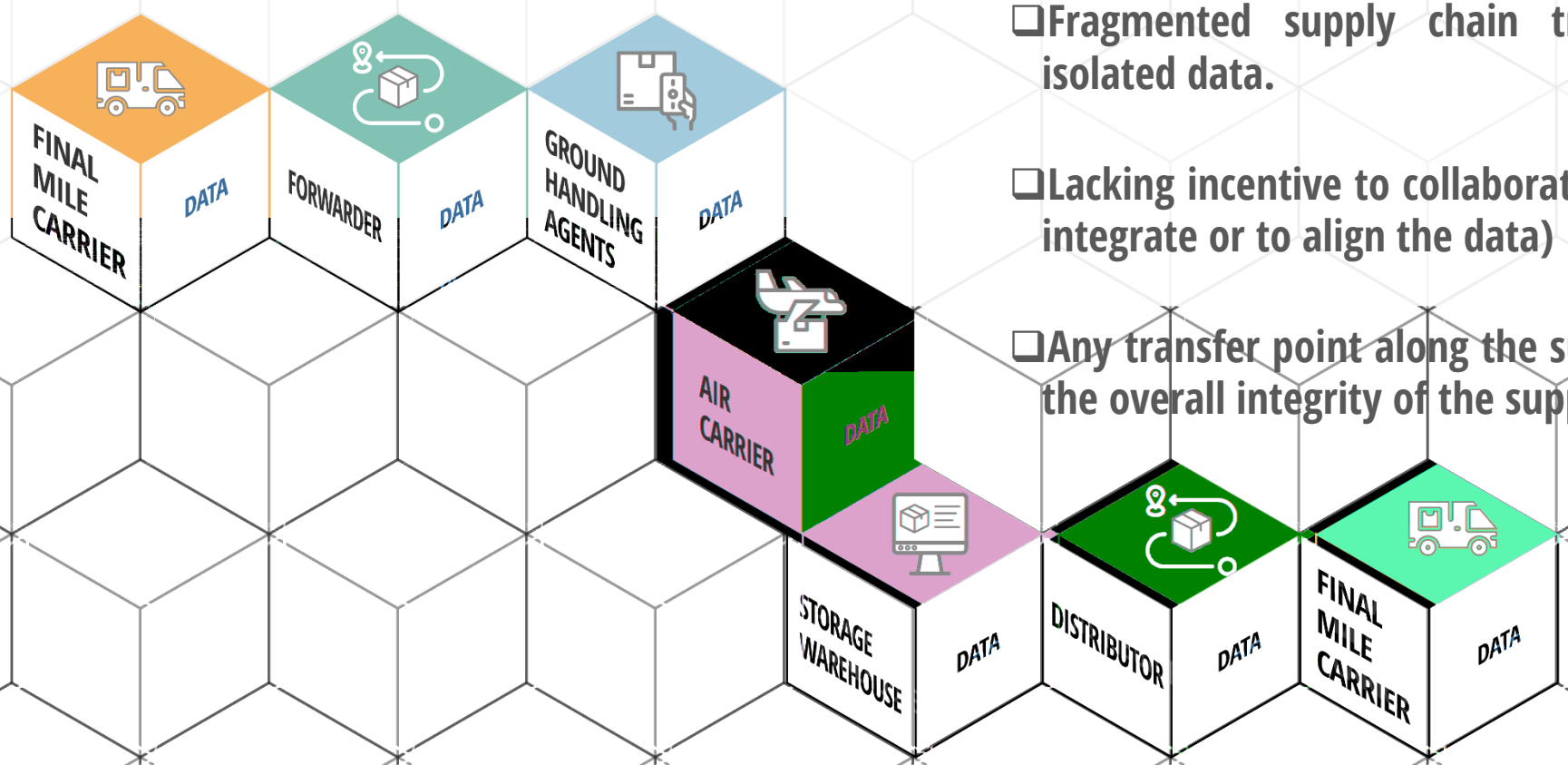
CHALLENGES OF VACCINES DISTRIBUTION – DATA TRANSPARENCY



- ❑Fragmented supply chain translating into fragmented and isolated data.
- ❑Lacking incentive to collaborate (suppliers not eager to share, to integrate or to align the data)
- ❑Any transfer point along the supply chain presents some risks to the overall integrity of the supply chain

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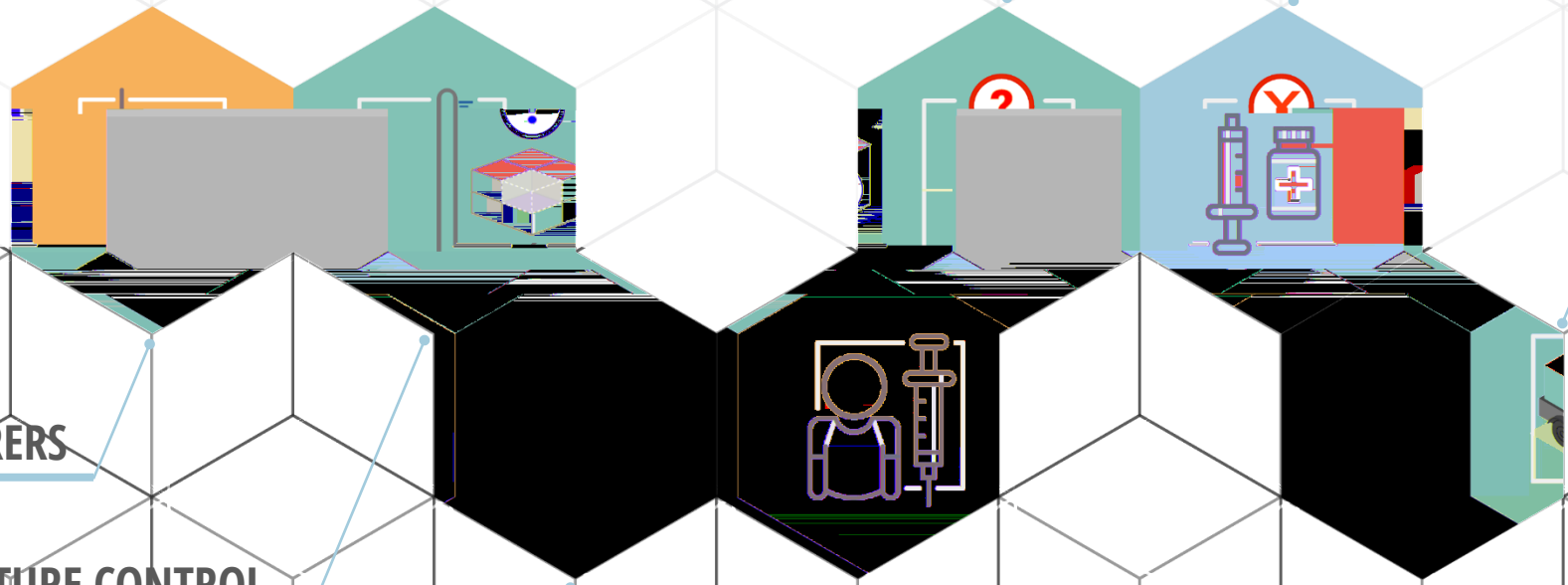
CHALLENGES OF VACCINES DISTRIBUTION – REAL-TIME TRACEABILITY



LOST IN TRANSIT

COUNTERFEIT VACCINE

HEALTH PROFESSIONALS & END CONSUMER DOSE

VACCINE MANUFACTURERS

TEMPERATURE CONTROL

ANTI-THEFT

DAMAGE IN TRANSIT

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It’s all about Trust

Trust Of Source

Trust Of Process

Trust Of Data

Trust Of Technology

Trust Of System

Trust Of People

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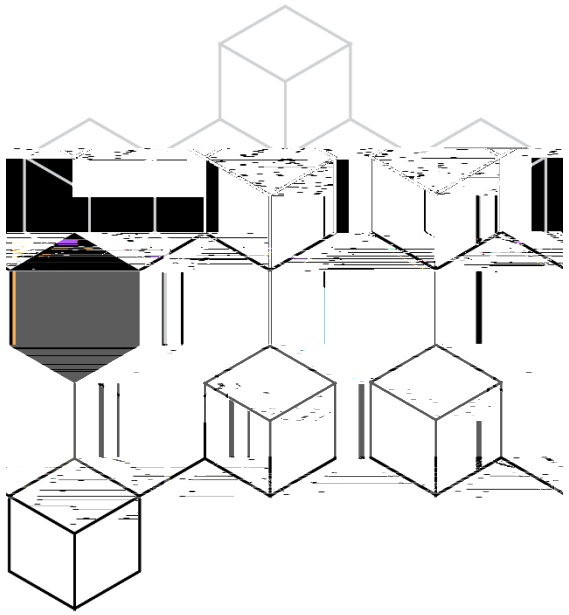

A JOURNEY OF TRUST POWERED BY BLOCKCHAIN TECHNOLOGY

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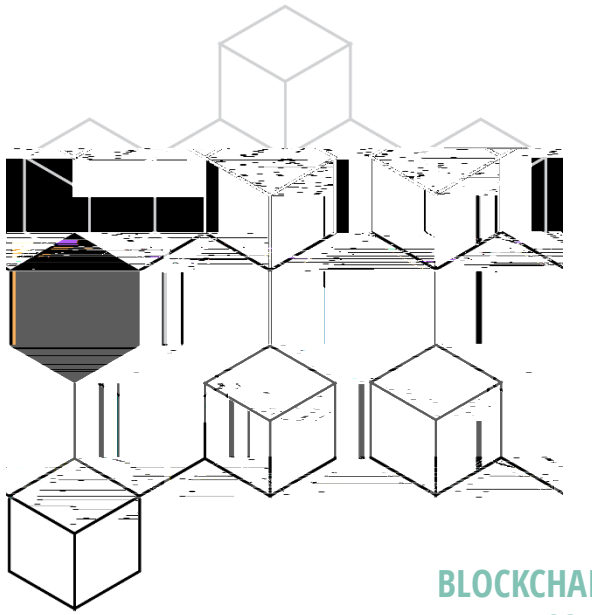
BLOCKCHAIN ENABLED DISTRIBUTION



COMPONENTS SUPPLIERS

1. Certificate of origin
2. Batch Number
3. Processing Data

VACCINE MANUFACTURER

1. Certificate of origin
2. Batch Number
3. Processing Data

AIRPORT

1. Certificate of origin
2. Batch Number
3. Packet Id
4. Processing Data
5. Temperature

WHOLESALER DISTRIBUTOR

1. Certificate of origin
2. Batch Number
3. Packet Id
4. Processing Data
5. Temperature

Hospital Clinics

1. Certificate of origin
2. Batch Number
3. Packet Id
4. Processing Data
5. Temperature

HEALTH PROFESSIONALS PATIENTS

1. Certificate of origin
2. Batch Number
3. Packet Id
4. Processing Data
5. Temperature
6. Invoice number
7. Customer Id

BLOCKCHAIN RECORD

BLOCKCHAIN SMART CONTRACT

1. Match information
2. Shipment Details
3. Temperature Details
4. Pay supplier

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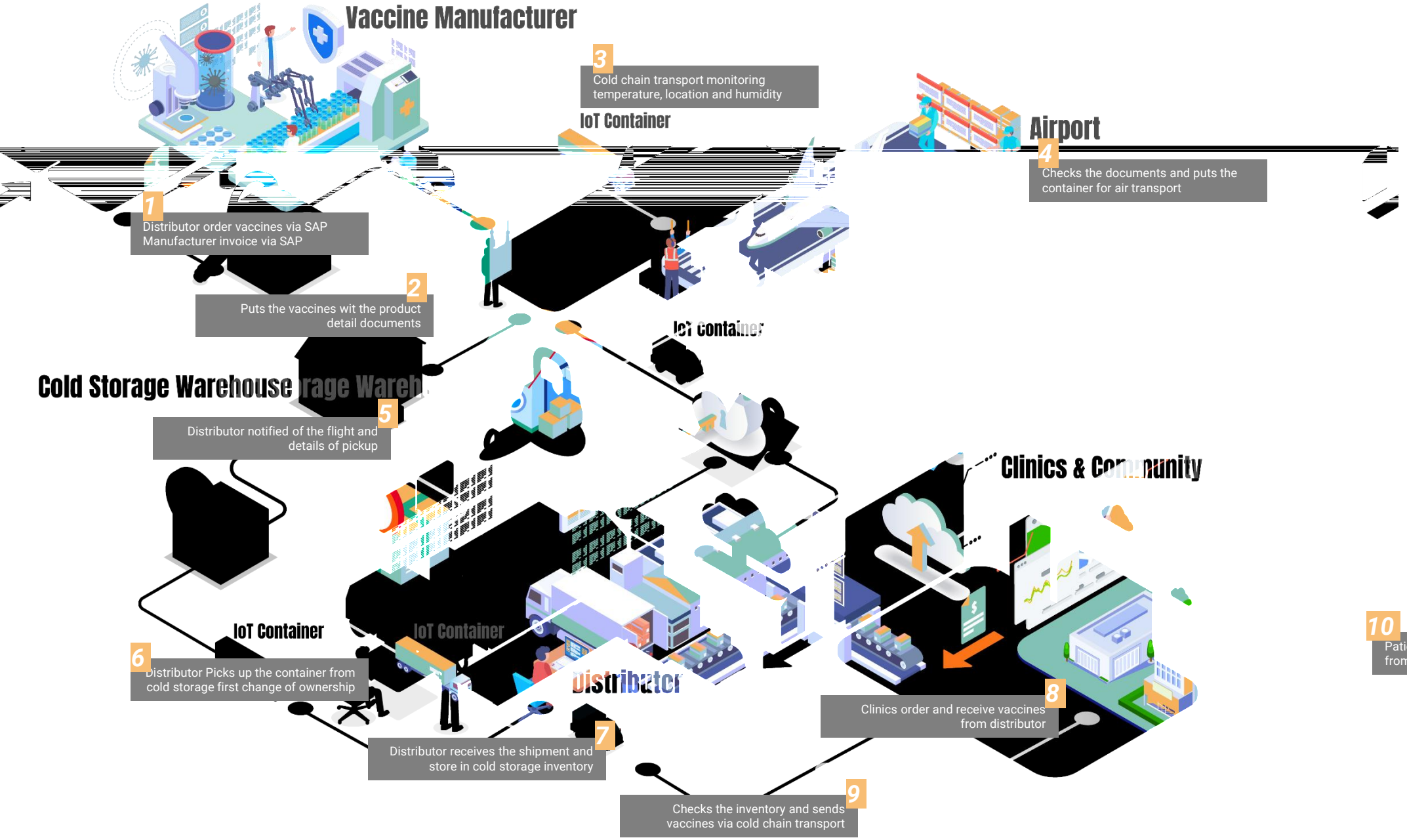
MCG | A Journey of Trust
Powered by Blockchain Technology



Solution Software

Standard Model

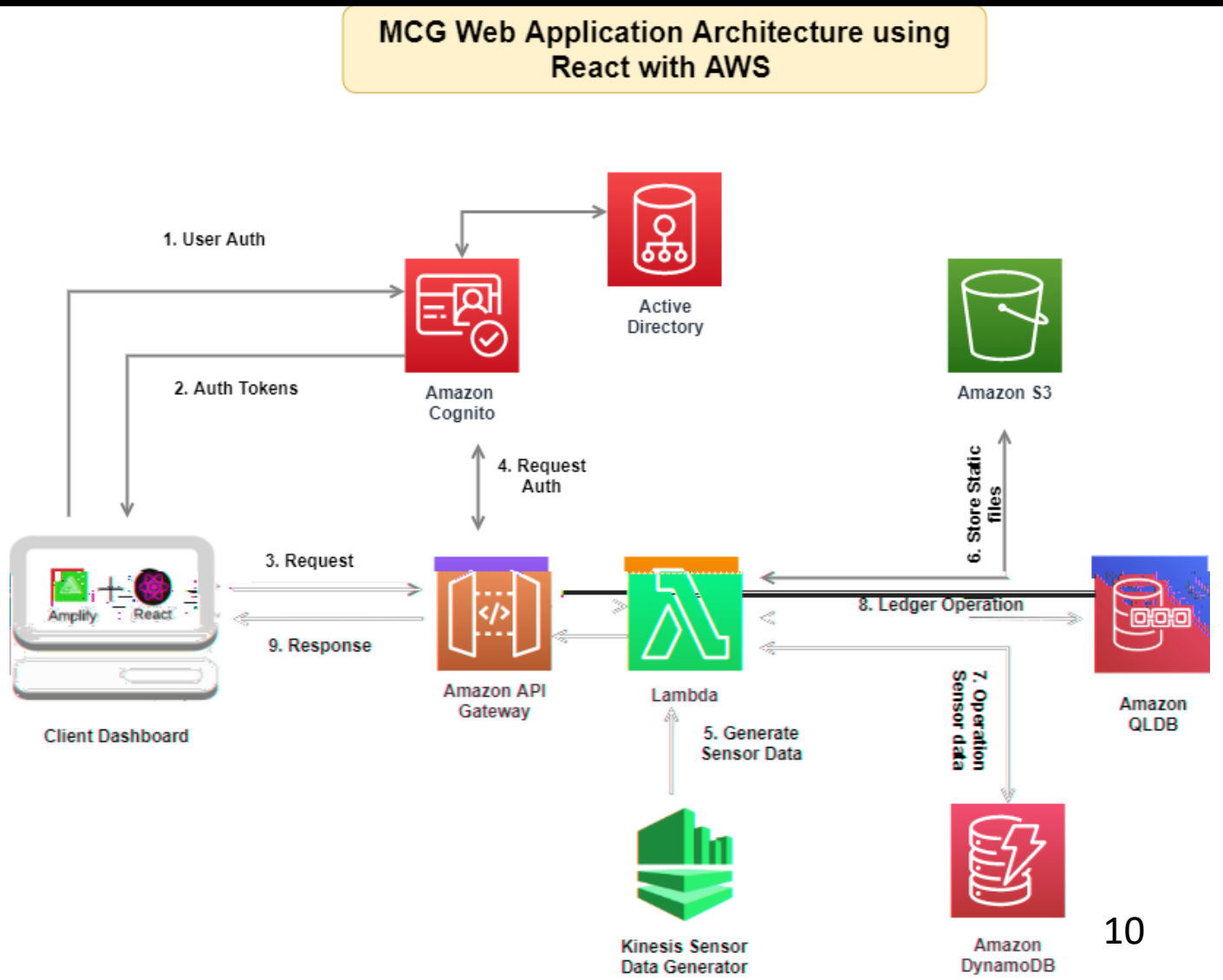
- Leveraging AWS Lambda
- Serverless architecture
  - Low management + quick scaling
- Cost saving at initial lower traffic in comparison to EC2 for Ethereum
- Benefits of blockchain - transparency, immutability
- Scalability at the cost of decentralization.

Premium Model

- Private Network using EC2s
- Used for exposing decentralized data via public pointers to QLDB
- Primarily for decentralized governance within the organization
- Sharing warehouse storage space via ERC20 tokens in a trustless manner.

Demo

Solution Software



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HOW TO DEPLOY BLOCKCHAIN AND PI-ENABLED SMART CONTAINER IN THE PHYSICAL INTERNET ERA

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HARDWARE: SMART CONTAINER LIUC

Standard Modular Smart Containers/Pallets

Made of environmental-friendly Material

Interconnected IoT Infrastructure

Interoperable Digital Assets Sharing

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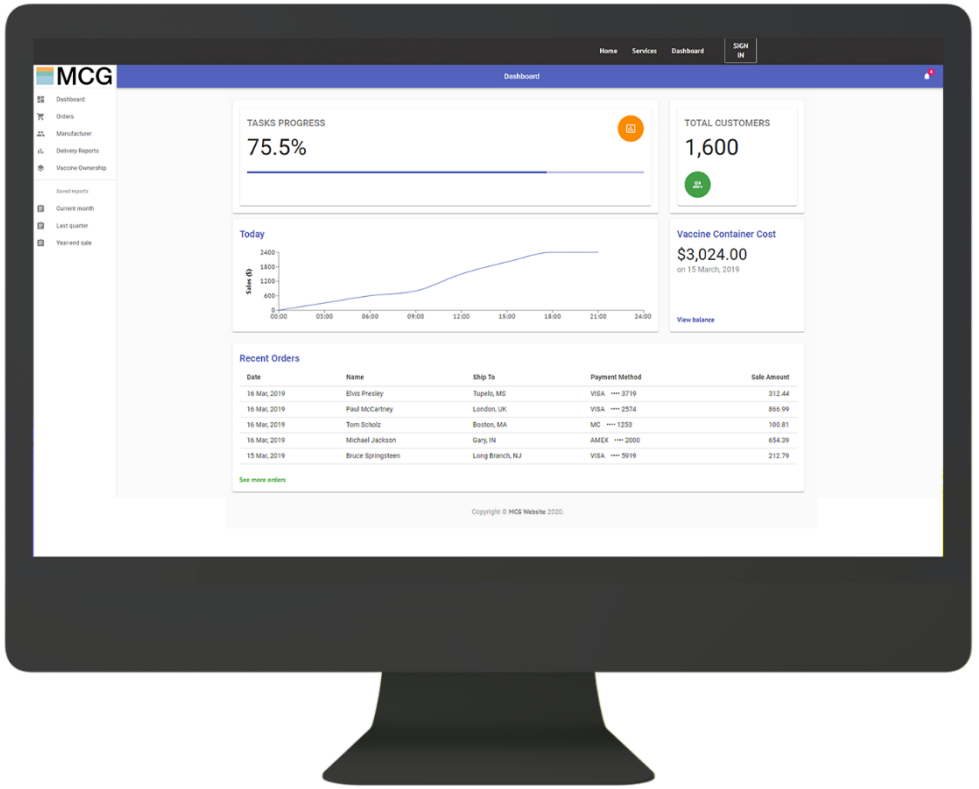
SOFTWARE: BLOCKCHAIN-POWERED VUILA

Blockchain-powered platform

Customizable real-time dashboard

Incentive model and algorithm for data owners

Predictive decision making



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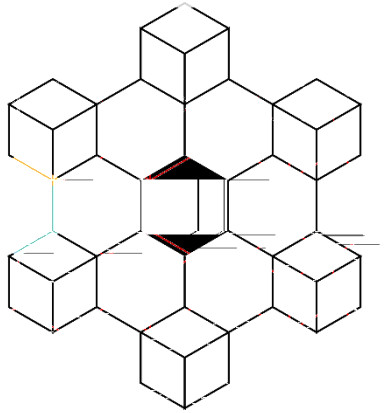
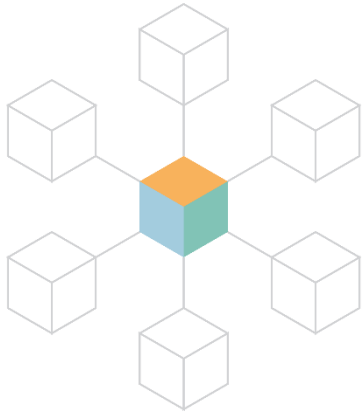
BLOCKCHAIN VS. DATABASE



MCG Approach: BLOCKCHAIN PLATFORM

Decentralized Platform
Peer-to-peer (P2P) network architecture
No ‘master’ that controls all nodes
Single point of failure can be solved, and not affect entire system
Data are distributed and stored in different places
Only the permissioned administrator with a private digital key can access the information



Current approach: DATABASE PLATFORM

Centralized Platform
Based on database server
Fully controlled by a company
If database server fails, it affects part of the network
Data are stored in dedicated server
Allows a company to fully control the data of vaccine and vaccinators

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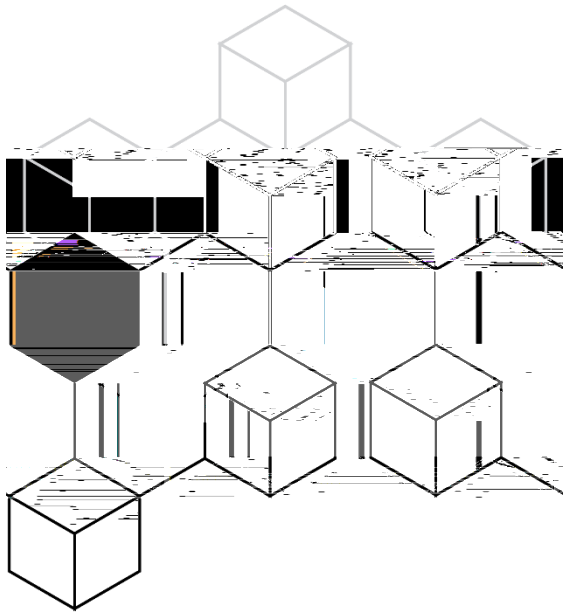
ADDED VALUE 1: INCREASE GOVERNMENT-MONITORING



HIGHER LEVEL

Each Vaccine Vial = Entity

Each Diluent Vial = Entity

- Capacity
- Temperature Range
- Probability of Failure or Delay

EACH STORAGE FACILITY

Transport

Freezer

Refrigerator

Refrigerator

Refrigerator

NEXT LEVEL

Next Level 1

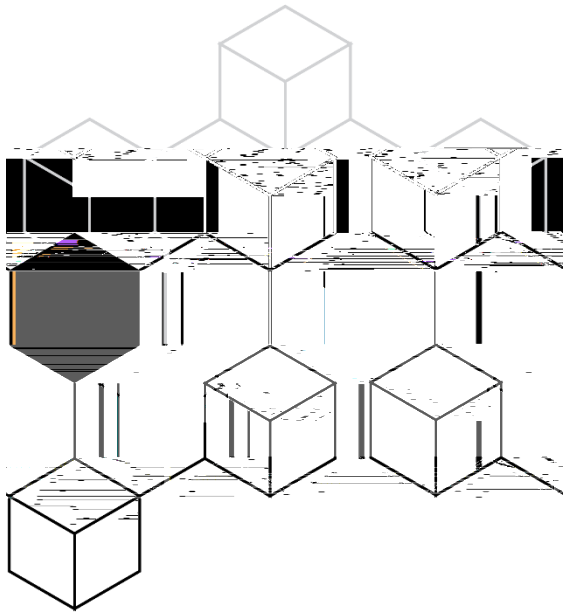
Next Level 2

Next Level 3

VACCINATOR

MCG Blockchain-powered platform enables the government to monitor the vaccine wastage even before the vaccine administration

ADDED VALUE 2: PRIVACY PRESERVATION



PERSONAL INFORMATION PROTECTION

The personal information (e.g., age, gender and phone number) of each consumer is protected and secured in the blockchain system.

ACCESS CONTROL

Access control lists are written in the blockchain, which means only the authorized one can read the data. Therefore, malicious usage of the data can be blocked.

DATA ENCRYPTION

Before data transmitting, each piece of data is encrypted. Therefore, the data leakage is prevented.

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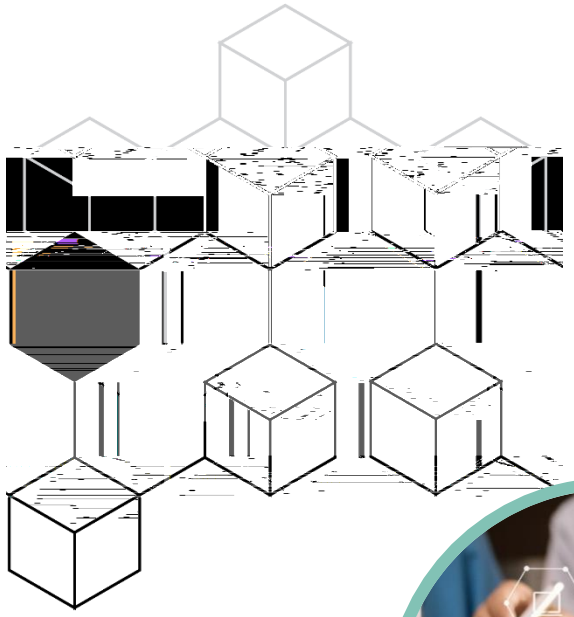
ADDED VALUE 3: REDUCE WASTAGE



ACCOUNTABILITY

The presence of wastage can be located to a specific step or even a person in the supply chain.

PREDICTION

Based on the previous and current data, the prediction can improve the current vaccine supply chain.

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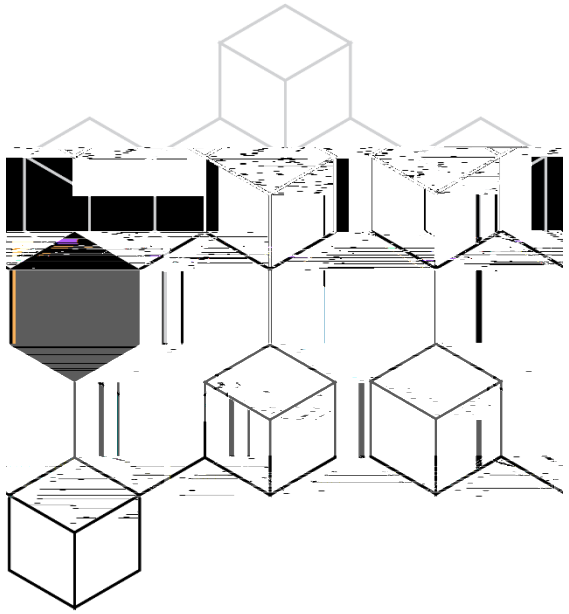
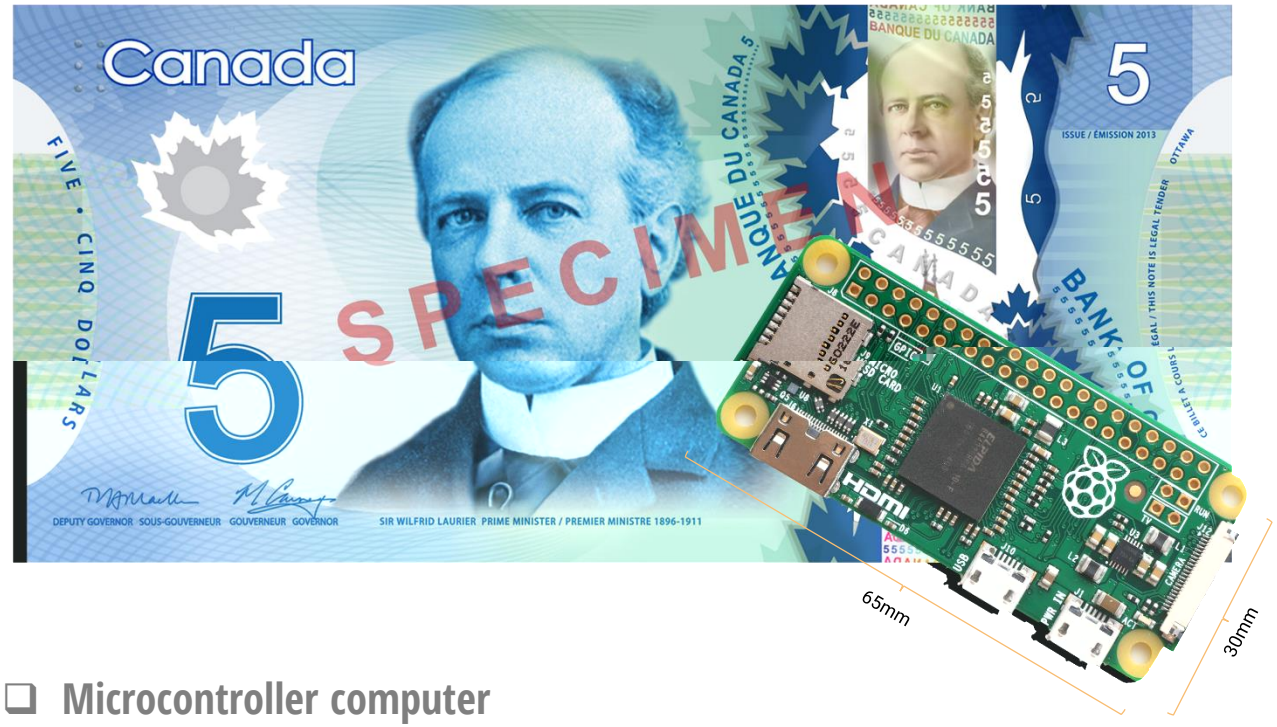
ADDED VALUE 4: COST-EFFECTIVENESS



Raspberry Pi



- ❑ Microcontroller computer
- ❑ Small size
- ❑ Comparatively lower cost
- ❑ With enough storage for the whole vaccine supply chain data
- ❑ Access temperature monitoring and GPS localization data through its rich hardware interfaces

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COMPANY OVERVIEW

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OUR TEAM

Clinton LIU
CEO & Founder
UN/CEFACT Expert
ISO/TC 307 &104 Technical Committee
LL.M. Business Law
Ph.D in Logistics and Supply Chain

Bo Chen
PIGC Co-Lead
Supply Chain Finance
Professor at Central University of Finance and Economics

David Wang
CTO
Blockchain Expert
Professor at UBC

Zheng Liu
AI/ML Expert
Professor of Engineering UBC

Advisors

Alain Bakayoko
PME MTL

Martin Wiedenhoff
Business Development Bank of Canada

Hisham Seifeddine
IATA & Canada Post

Grainne Lynch
Accenture, Traceability

Simon Potter
Ex-President Canadian Bar Association
President Consultation Simon Potter Inc

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OUR PARTNERS

UNECE

ELUPEG alice

ALICE-ELUPEG interest group:
Blockchain Applications for Logistics

Fraunhofer IML

Économie et Innovation Québec

ENTREPRENEURIAT LAVAL | COMPLICE DE VOS PROJETS

The Chartered Institute of Logistics and Transport

Canada NRC·CNRC

aws

PME MTL GRAND SUD-OUEST

CBSCA Canadian Blockchain Supply Chain Association

Blockchain @UBC

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