From Vaccines to Vaccinations:
Blockchain & Its importance in Covid-19 Vaccine Distribution

eZTracker
Verify your product in seconds

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Leading Vaccine Distributor in Asia

Majority of biologics, including Covid19 vaccines, distributed in the Asia Pacific region flow through our cold-room infrastructure

moderna

AstraZeneca

Johnson & Johnson

SANOFI PASTEUR

Pfizer

MSD

gsk
GlaxoSmithKline

~ 40 Million
Vaccines sold across the region
(2019)

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Our presence across the healthcare and vaccine value chain form a strong foundation for our digital solutions

WHO WE ARE

Asia's Largest Pharma Distributor
Distributor for majority of branded pharma products in our region, including over 75% of all branded vaccines

World Class Technology Players
Provide logistics and patient solutions, alongside collaboration with global partners Accenture and Microsoft

Commitment to Quality
Largest cold chain network in the region with facilities that cover the breadth of temperature requirements
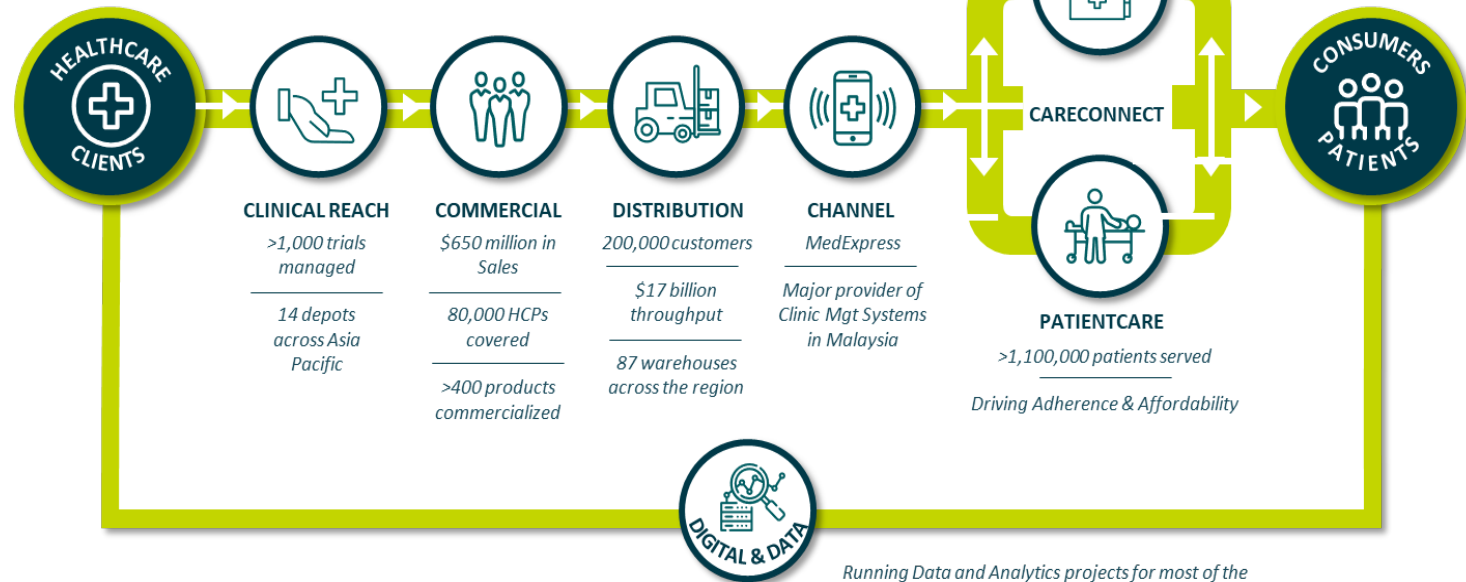
Direct Healthcare Network
Over 80% of healthcare institutions in Asia are serviced directly by us – allowing us to better support their needs

OUR BREADTH OF EXPERIENCE AND EXPERTISE – OPS, PATIENTS, TECH

BALANCING TECHNOLOGY INNOVATION WITH A CENTURY OF HEALTHCARE EXPERIENCE

> 10 million members insured (MY, TH, PH)

One of the largest TPAs in the region

HEALTHCARE CLIENTS

CLINICAL REACH
>1,000 trials managed

14 depots across Asia Pacific

COMMERCIAL
$650 million in Sales

80,000 HCPs covered

>400 products commercialized

DISTRIBUTION
200,000 customers

$17 billion throughput

87 warehouses across the region

CHANNEL
MedExpress

Major provider of Clinic Mgt Systems in Malaysia

PAYOR SERVICES

CARECONNECT

PATIENTCARE
>1,100,000 patients served

Driving Adherence & Affordability

**CONSUMERS PATIENTS**

DIGITAL & DATA

Running Data and Analytics projects for most of the Top Global pharma in the region

First ever live pharma supply chain blockchain in Asia

Winner of multiple Regional innovation awards (e.g., IDC Digital Visionary, 2019, 2020)

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Key vaccination management issues along pharma supply chain

Traceability of Vaccines Hampered by Problems in Information Exchange along Supply Chain

VACCINE SUPPLY → **DISTRIBUTION** → **VACCINATION SITES/ HOSPITALS/ CLINICS** → **CITIZENS**
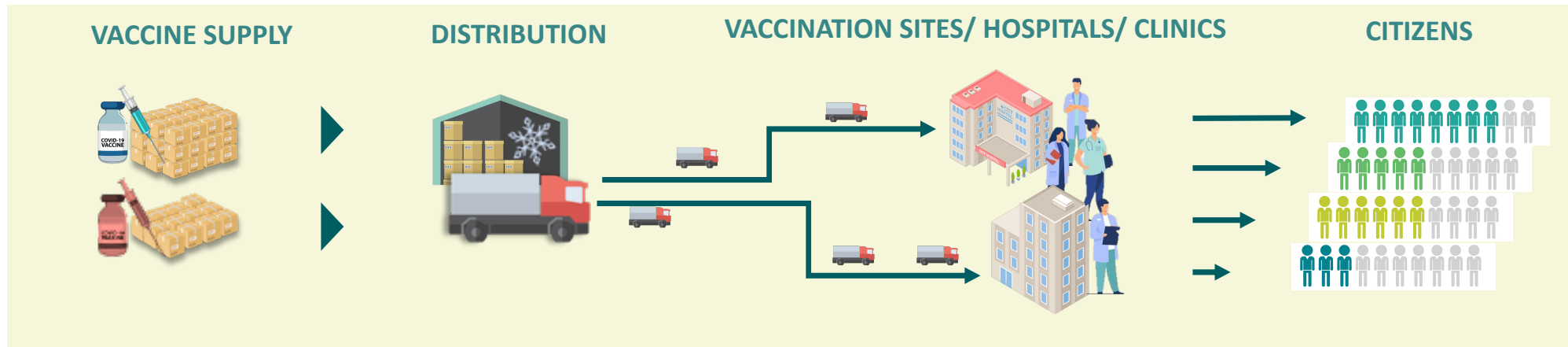
Data Exchange Challenge

Traditional database systems to solve for traceability tended not to work as key parties on the supply chain
(a) feared loss of ownership on their data and (b) were reluctant to send that data to a third party

Serialization Data Challenge

Serialization coding standards differ across Pharma companies: Considerable challenges to the systems of in-country Distributors

Ops Tracking Challenge

No systematic recording of activities to each serialized item. Creates blind spots for quality control (cold chain temperature) & counterfeit/ authenticity tracking

Drug-to-Patient Challenge

Non-involvement of the Clinics/ Hospitals means tracking the dispensing of each serialized product is not possible

Patient Info Access Challenge

Patients have no easy access to the provenance of their vaccines

Insights & Reporting Challenge

Near real-time analytics and reporting layer is required for issue-identification and better planning to minimize product wastage

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Challenge further exacerbated by rampant counterfeit Covid-19 vaccines and related consumables at both global and local levels

- Perpetrators have been maximizing illicit opportunities from the pandemic to churn out falsified or inauthentic Covid-19 vaccines, diagnostics tests, consumables, vaccine passports/ certificates, as well as cyber-security threats on digital platforms.

- As more and more countries across the world are well underway in its Covid-19 vaccination among its population, such threats continue to plague global and local health authorities, enforcement agencies, pharma manufacturers, healthcare professionals and key stakeholders in the vaccination ecosystem.

The COVID vaccine market is worth at least $150 billion. Can we stop it being flooded with fakes?

Empty vials of Pfizer/BioNTech's Comirnaty vaccine. Image: Reuters

3,000 doses of fake COVID-19 vaccines confiscated, illegal sales began in September

By Wan Lin and Hu Yuwei
Published: Feb 01, 2021 09:08 PM

The warehouse near Johannesburg, South Africa, where police discovered a shipment of fake COVID-19 vaccines in November 2020.   Courtesy of Interpol

'Tip Of the Iceberg': Interpol Says Fake COVID-19 Vaccines Were Smuggled Across Continents

BY SIMON SHUSTER   MARCH 3, 2021 5:01 AM EST

By the time police discovered the shipment of fake COVID-19 vaccines, the vials had travelled over 6,000 miles from China to South Africa, the work of a smuggling ring that has produced thousands of counterfeit doses, according to Interpol, the global police agency that helped break up the operation.

Thousands jabbed with unknown substances at fake Covid-19 vaccination camps in India

Residents lining up to register for a dose of the Covaxin vaccine during a vaccination drive at a school in Hyderabad on July 1, 2021. PHOTO: AFP

Singapore joining Interpol-led global financial crime task force looking into COVID-19 vaccine scams

Police in South Africa seized hundreds of fake COVID-19 vaccines and made several arrests following a global alert issued by Interpol. (Photo: INTERPOL)

SINGAPORE: Singapore is joining an Interpol-led global financial crime task force looking into a number of areas, including COVID-19 vaccine scams.

The task force, initially comprising Singapore, the United States, the United Kingdom and Ireland, will look at illicit money flows in transnational financial crimes and how countries can combat these crimes more effectively.

Fake COVID-19 vaccination certificates for sale in Mexico

Around 21 million people have been fully vaccinated against the coronavirus in Mexico, a country of 126 million AFP/ALFREDO ESTRELLA

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eZTracker

A blockchain-based solution that provides full and instantaneous material **traceability across the Pharma supply chain** allowing end-users to verify the **authenticity of vaccines and drugs** to a batch / box / vial level and **enhancing business and operational efficiencies** for Healthcare Organizations

OUR SOLUTION COMPONENTS

Blockchain Network: a non-intrusive method of data exchange between different supply chain parties, allowing easy tagging of 'activities' (e.g. delivery, storage, dispensing, etc.) against individual unique serialized pharma products

eZTracker Digital ID: receives serialization info from manufacturers, posts it onto the blockchain and structures subsequent tagging of activities against each unique item

eZTracker Ops: interacts with warehouse/ logistics systems to tag standard warehouse, operations and distribution activities against each unique serialized item
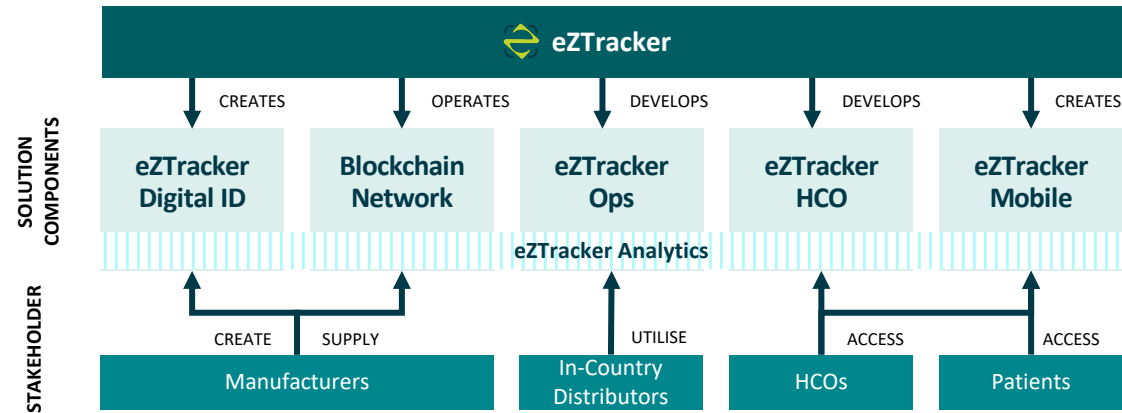
eZTracker HCO: interacts with clinic and hospital management systems to tag prescription and dispensing activities to each unique serialized item

eZTracker Mobile: allows users to verify instantly if products are from an authorized source and tags user scans to each unique serialized item

eZTracker Analytics: allows authorized users to view, extract and analyze the activities of all serialized items (e.g. supply chain movement, scan history, etc.)
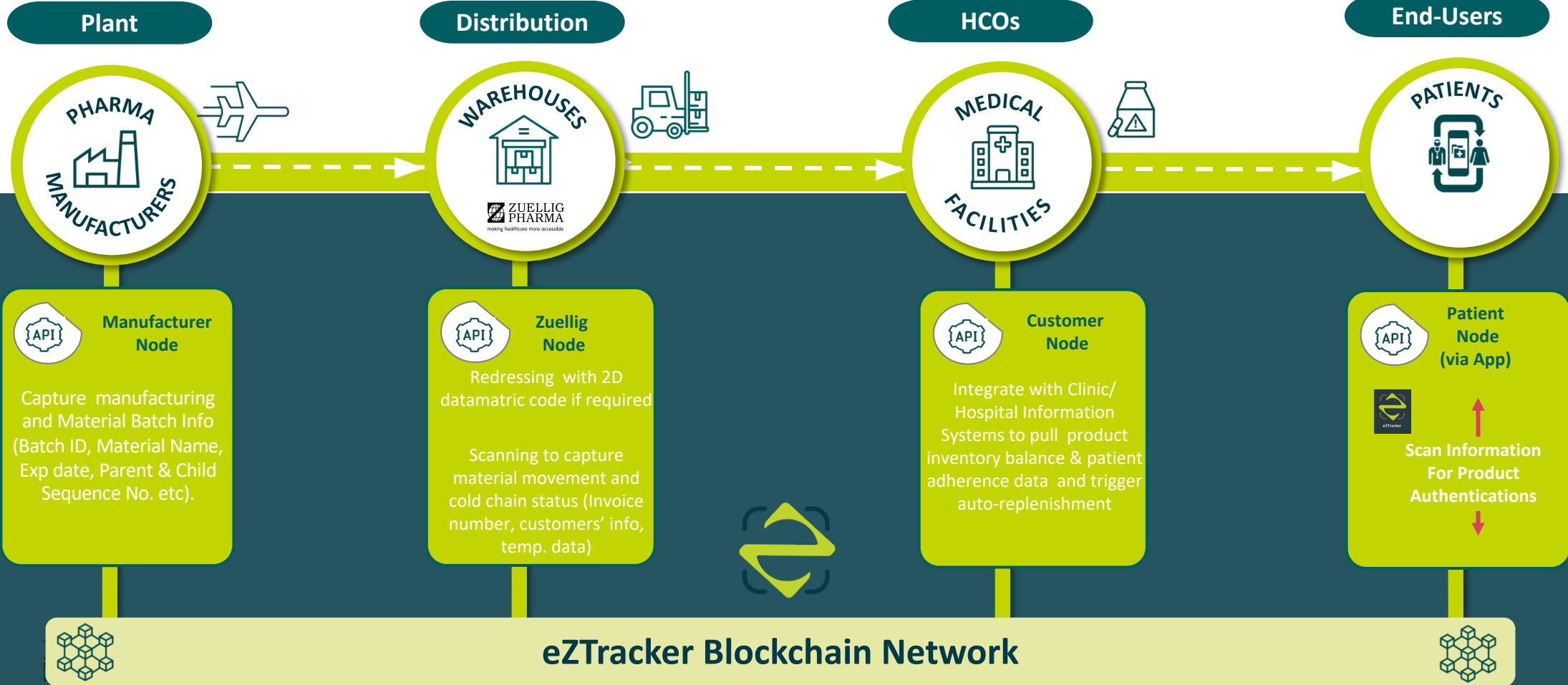
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To be Asia's first and best-in-class blockchain solution for supply chain connectivity and traceability for Pharma / Vaccines

A 'Plant to Patient' Material Traceability for Pharma Manufacturers

To Build & Deploy a Multi-Tenant Blockchain Solution

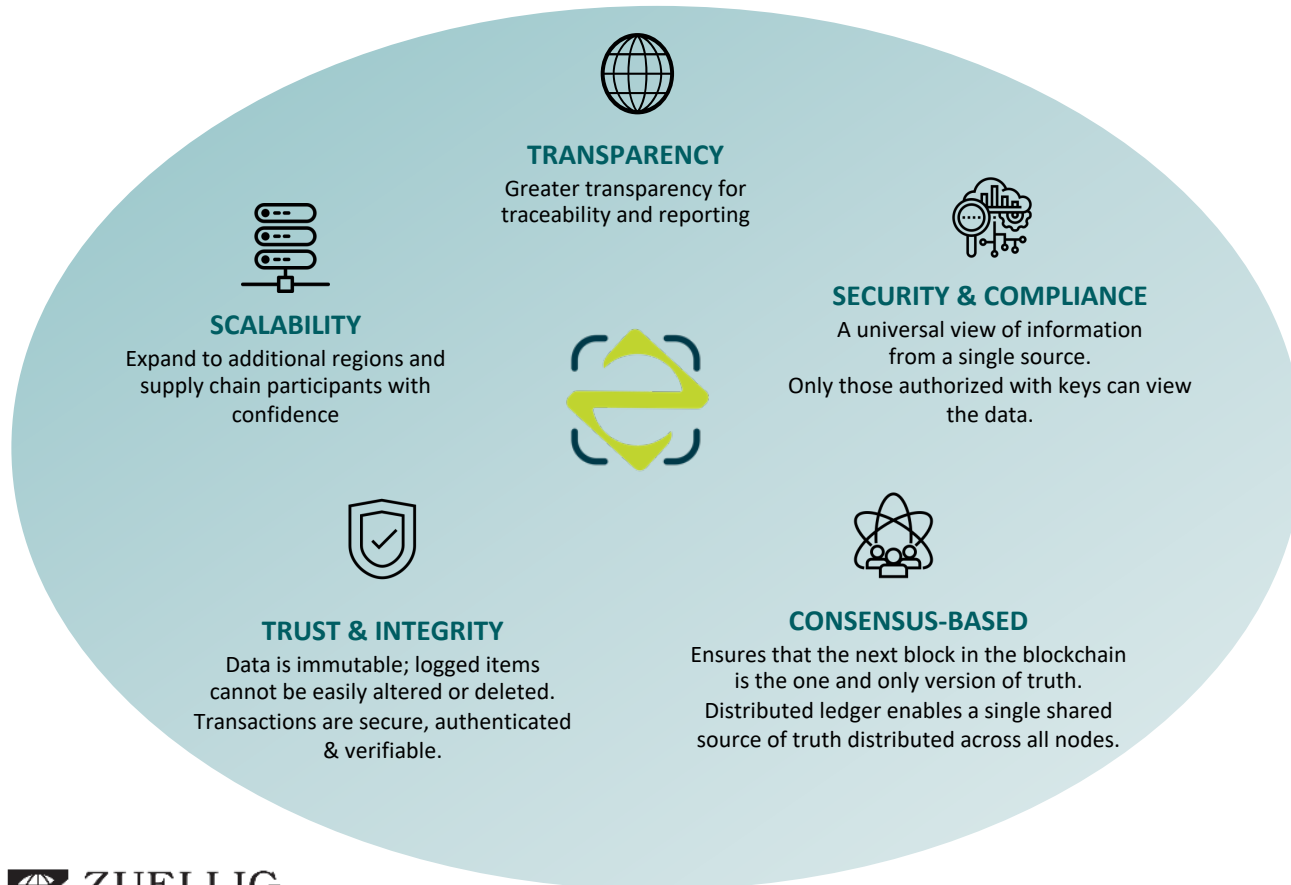**Enhanced Operational Efficiencies and Create Business Value for Healthcare Organizations**

Quality Assurance & Product Safety for Patients

| Plant | Distribution | HCOs | End-Users |

PHARMA MANUFACTURERS

WAREHOUSES

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MEDICAL FACILITIES

PATIENTS

Manufacturer Node

Capture manufacturing and Material Batch Info (Batch ID, Material Name, Exp date, Parent & Child Sequence No. etc).

Zuellig Node

Redressing with 2D datamatric code if required

Scanning to capture material movement and cold chain status (Invoice number, customers' info, temp. data)

Customer Node

Integrate with Clinic/ Hospital Information Systems to pull product inventory balance & patient adherence data and trigger auto-replenishment

Patient Node (via App)

eZTracker

Scan Information For Product Authentications

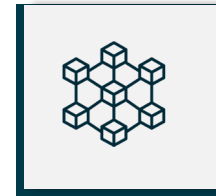## eZTracker Blockchain Network

Why the use of blockchain technology?

Definition of Blockchain:

A growing list of records, called blocks, that are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.

TRANSPARENCY
Greater transparency for traceability and reporting

SCALABILITY
Expand to additional regions and supply chain participants with confidence

SECURITY & COMPLIANCE
A universal view of information from a single source. Only those authorized with keys can view the data.

TRUST & INTEGRITY
Data is immutable; logged items cannot be easily altered or deleted. Transactions are secure, authenticated & verifiable.

CONSENSUS-BASED
Ensures that the next block in the blockchain is the one and only version of truth. Distributed ledger enables a single shared source of truth distributed across all nodes.

Establish Blockchain Network as Foundation
- Recognize that the network is the foundation to form a blockchain consortium
- Build key capabilities in material trackability, quality assurance, patient safety and supply chain finance
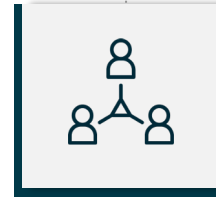
User Friendly Onboarding Process
- Detail tech and non-tech guidance to facilitate onboarding
- Provide out-of-box node service to customer
- Automate steps on setting up blockchain node
- Provide customer support before and after onboarding
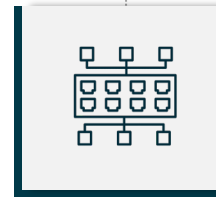
Interoperability Across Blockchain Networks
- Ability to integrate with multiple pharmaceutical blockchain networks
- Connect to these networks to create a bigger healthcare ecosystem
- Reduce silos to encourage adoption and new solution creation

Open API
- Expose APIs to partners
- Design APIs with security and access controls in place
- Allow other service vendors to add more features

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Outcome of eZTracker for vaccine supply chain & its stakeholders

PRODUCT AUTHENTICATION FOR PATIENTS & HCPS

- Empower patients with the verification of their vaccine

- Create confidence that their products are quality assured and genuine

- Allow for more effective and accurate adverse event reporting and product recalls

TRACK & TRACE TO COMBAT COUNTERFEIT & CROSS BORDER TRADE

- Tackle re-selling of products to alternative channels and/or cross border

- Reduce margin erosion and revenue loss

- Strengthen brand trust via identifying "grey trade" occurrences

- Reduce non-compliance with local regulatory approval and labeling requirements

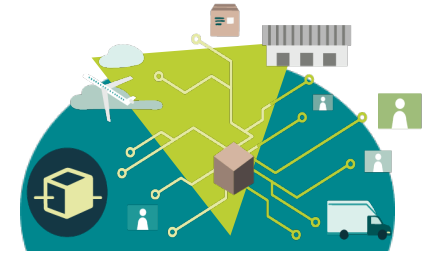## DRIVING OPERATION EFFICIENCIES FOR HEALTHCARE ORGANIZATIONS

- Facilitate clinics' and hospitals' auto-replenishment mechanism; thereby

  - Minimize customers' out-of-stocks and maintain healthy inventory levels of products

- Effective tracking and rectification of goods returns, expired and/or write off goods from customers

VIGILANCE IN VACCINE COLD CHAIN / TEMPERATURE MONITORING

- Visibility of products' storage delivery temperature conditions

- Enables easy verification of products' cold chain status

- Minimize product wastage and create added quality assurance for products

Success Story: Supporting the fight against counterfeit vaccines

CHALLENGE:

During a joint operation by the local customs and its health agencies in Hong Kong, local authorities seized suspected counterfeit vaccines; thereby exposing medical clinics who were administering fake vaccines. This caused major panic and complaints among patients who were worried about the safety of their vaccines.

As the Pharma Client was looking for a solution to enhance the traceability of their products and reassure patients about the authenticity of their vaccine. eZTracker was launched in 2020 to tackle the prevalent counterfeiting and cross-border issue.

SOLUTION:

Zuellig Pharma deployed eZTracker, a non-intrusive method of information exchange that protects data ownership and ensures data accuracy with virtual queries from patients/ HCPs.

OUTCOME:

TRACE
- Using blockchain, eZTracker identifies the authenticity of products, helping address falsified and/ or cross border products.
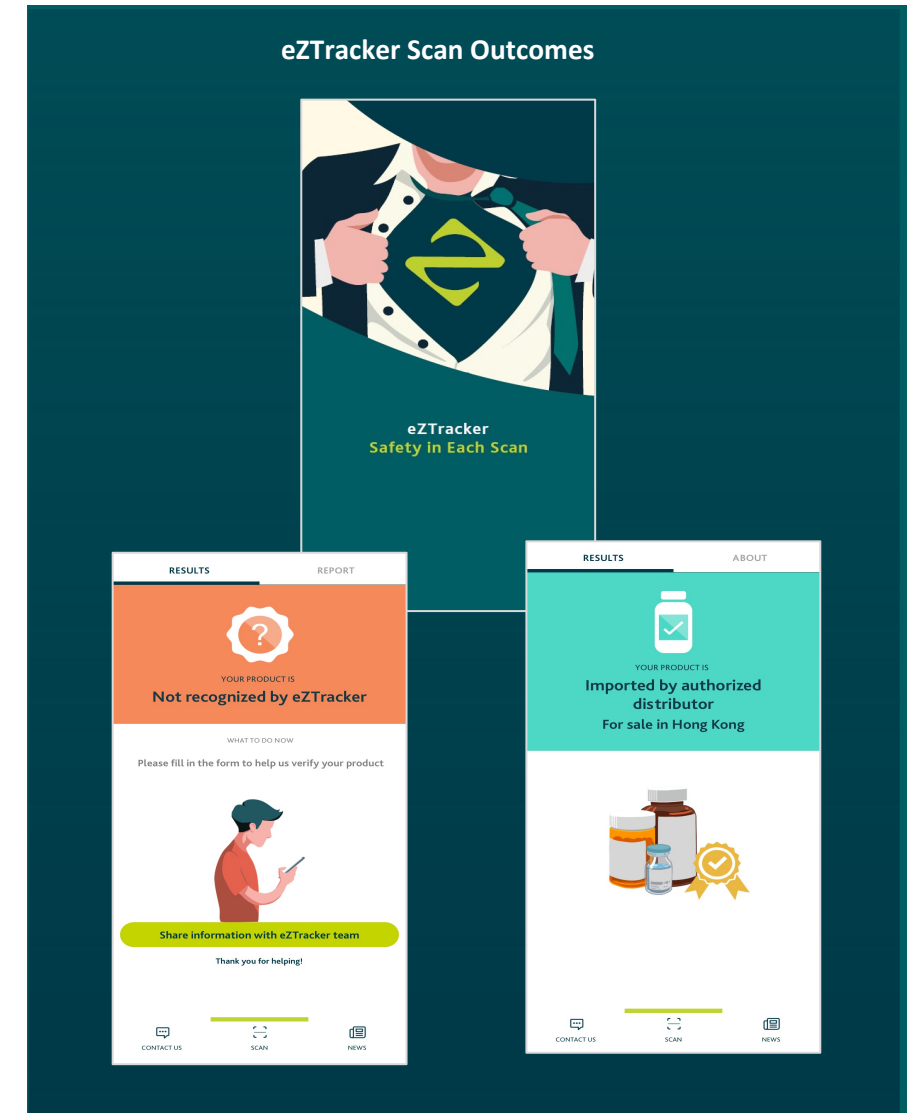
STRENGTHEN
- eZTracker sends triggers to the manufacturer, authorized distributor and Zuellig Pharma upon detection of an unauthorized source.

EDUCATE
- Raised HCPs' and consumers' awareness of the importance of verifying product authenticity and identifying cross-border trading

eZTracker Scan Outcomes

eZTracker
Safety in Each Scan

RESULTS / REPORT

YOUR PRODUCT IS
Not recognized by eZTracker

WHAT TO DO NOW
Please fill in the form to help us verify your product

Share information with eZTracker team

Thank you for helping!

CONTACT US / SCAN / NEWS

RESULTS / ABOUT

YOUR PRODUCT IS
Imported by authorized distributor
For sale in Hong Kong

CONTACT US / SCAN / NEWS

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Success Story: Supporting the fight against counterfeit vaccines

Analytical Insights into Patient Scan Behaviour, Counterfeit & Cross Border Monitoring

eZTracker Scan: Daily/ Weekly/ Monthly Scan # for Vigilant Tracking

Tracking # of cross-border scan by **Country**:
to spot unusually high & possibly suspicious activities

Success Story: Supporting the fight against counterfeit vaccines

Geo-location Identification of Cross-Border Scans Taking Place in
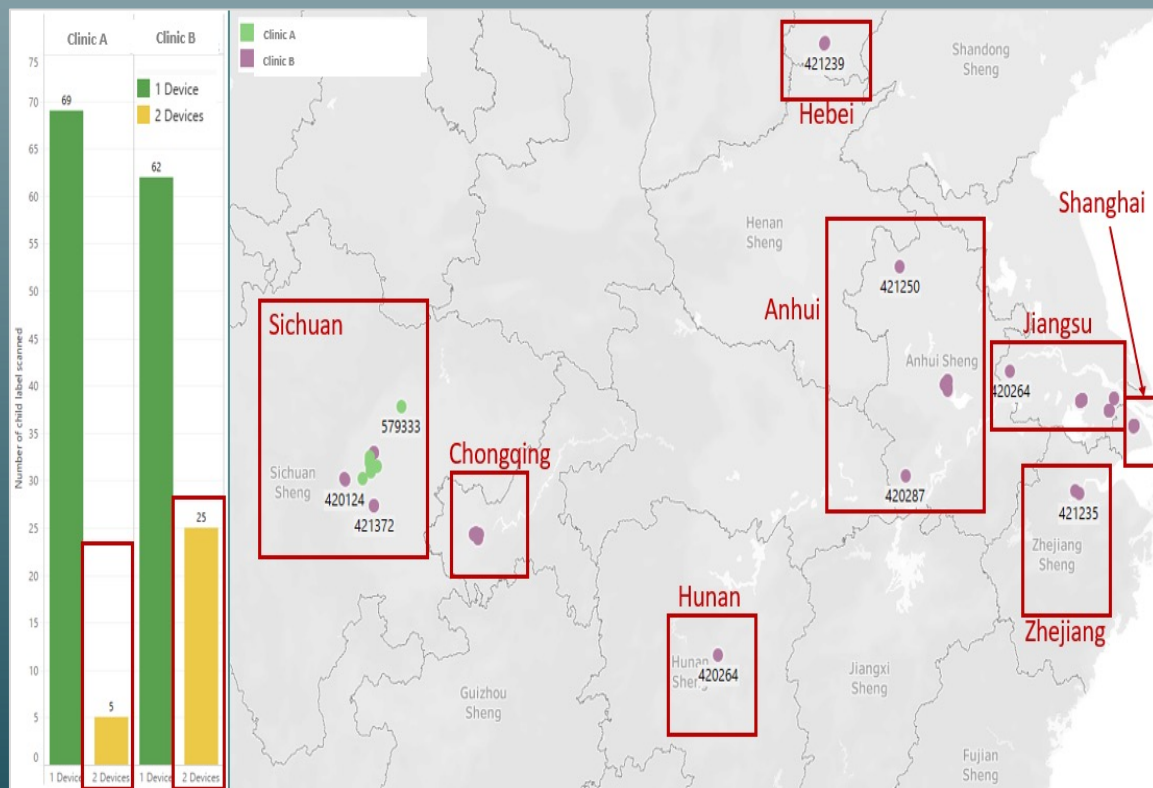
Heatmap highlighting Intensity/ Concentration of Cross-Border Scans

Time Stamp (UTC +0)	Location	Material	Batch	Date	Result	Child Code	Latitude	Longitude	Device	iso3166	Customer	Invoice
19/4/2021 7:29			S032XX	19/4/2021	GRAY IMPORT	681185	22.52532	114.05309	5EB9B2A7-2B35-4BD3-BF60-265F903EA942	CN	AA	123
19/4/2021 8:36			NA	19/4/2021	COUNTERFEIT	692110	22.52542	114.05305	5EB9B2A7-2B35-4BD3-BF60-265F903EA942	CN	BB	456
19/4/2021 8:53			NA	19/4/2021	COUNTERFEIT	692110	22.52542	114.05295	5EB9B2A7-2B35-4BD3-BF60-265F903EA942	CN	CC	789
19/4/2021 8:54			T003XX	19/4/2021	GRAY IMPORT	542350	22.52522	114.05313	5EB9B2A7-2B35-4BD3-BF60-265F903EA942	CN	DD	1102
19/4/2021 14:04			S0321XX	19/4/2021	GRAY IMPORT	681185	22.52531	114.05311	5EB9B2A7-2B35-4BD3-BF60-265F903EA942	CN	EE	1135

THANK YOU

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