Cold Chain Traceability

Bringing transparency to Cold Supply Chain

Event Organizers

Venue Support

dcentrum Community

Connect | Collaborate | Create

Tech Mahindra

Team that made this work

Mohit Bathla
Product Manager

Mahesh Wankhade
Software Developer

Rishi Cherukuri
Idea Author & Solution Architect

Sandhya
Backend Developer

Tameem
Business Analyst & Domain Expert

25% of vaccines go waste due to lack of cold chain

Sushmi Dey | TNN | Updated: Jul 1, 2016, 16:19 IST

A-   A+

HIGHLIGHTS

- 25% vaccines are wasted due to poor storage facilities

- Most vaccines have to be preserved in a low temperature

- Health ministry has planned over 27,000 cold storage points for storing and distributing vaccines

TheScientist

EXPLORING LIFE, INSPIRING INNOVATION

Home / Daily News

Toward Breaking the Cold Chain

Research efforts aim to obviate the need for vaccine refrigeration.

Jan 24, 2017
KERRY GRENS

Earlier this month, the New Jersey Department of Health announced that 900 children statewide received vaccines that may not have been stored properly. Pediatrician Michael Bleiman allegedly hadn't refrigerated the shots at the right temperatures, compromising the efficacy of the immunizations and potentially putting kids' health at risk—not to mention causing headaches for hundreds of families and physicians who now have to determine whether these children need to be revaccinated.

Regional Agenda   Future of Health and Healthcare

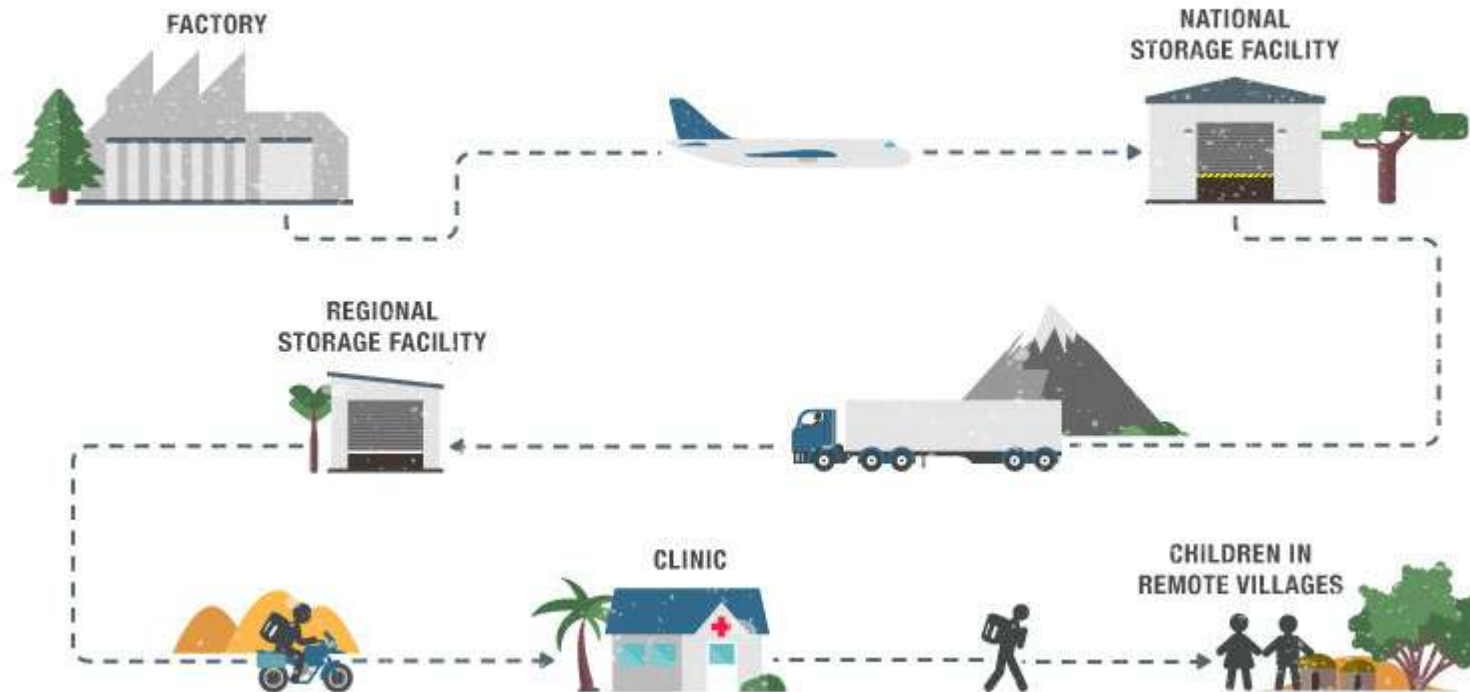# Over half of vaccines are wasted globally for these simple reasons

Vaccine Supply Chain (ColdChain)

The long road to vaccination

Vaccines must be kept between 2-8°C all the way from the factory to some of the most remote places on earth.

FACTORY

NATIONAL STORAGE FACILITY

REGIONAL STORAGE FACILITY

CLINIC

CHILDREN IN REMOTE VILLAGES

Source: MSF

Rx

Highly Purified
Chorionic Gonadotrophin
Injection 2000 I.U.

हुकॉग - २००० एच्पी

HUCOG® - 2000 HP

2000 I.U./1ml

For Subcutaneous /
Intramuscular
Injection only

HP

SCHEDULE H PRESCRIPTION DRUG -
CAUTION :
Not to be sold by retail without the
prescription of a Registered
Medical Practitioner.

For dosage and administration,
refer pack insert.

Store between 2°C - 8°C.
Do not freeze.
Protect from light.

SAMSUNG

DIGITAL
INVERTER
TECHNOLOGY

10 - ON THE COMPRESSOR
WARRANTY

Convertible
Freezer

DIGITAL THERMOMETER
4.1°C
28°C
18°C   43%

ACETEQ   DC-3

+   SET   -

-23°C   1°C
-21°C   2°C
-19°C   3°C
-17°C   5°C
-15°C   7°C

Freezer Freezer Fridge

CONNECT

SANOFI

ELBONI FREEZE

For Intramuscular Use Only
See enclosed Pack insert for
administration.
Mfg. Lic. No.: G/28D/VAC/03
Marketed by: Zydus
Vaxxicare
(A div. of Cadila Healthcare Ltd.)

Mfg. by: Cadila Healthcare Limited
Plot Survey No. 23, 25/P, 37, 40/P, 42 to 47,
Sarkhej-Bavla N.H.No. 8A,
Opp. Ramdev Masala, Village Changodar,
Tal: Sanand, Dist. Ahmedabad-382213
To report adverse events, call toll free on
1800 419 1141 or visit www.zyduscadila.com

Batch No. : 04CP028
Mfg. Date : 12/2018
Exp. Date : 11/2019
Maximum
Retail Price ₹ : 1140.00
per Pack
(Inclusive of
All Taxes)

8 901120 061662

For Intramuscular Use Only
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1800 419 1141 or visit www.zyduscadila.com

Batch No. : 04CP030
Mfg. Date : 01/2019
Exp. Date : 12/2019
Maximum
Retail Price ₹ : 1140.00
per Pack
(Inclusive of
All Taxes)

8 901120 061662

Why IOTA?

- The technology behind IOTA is the only technology that can **scale** and support the millions of transactions using Sensors and DLT.

- It is **feeless** and can support **partitioning** – meaning that local transactions of recording the temperature and location can be secured in periods **without direct access to internet** such as remote areas during transport.

- Tracking with Geo Location and condition of Vaccine maintained like temperature **monitoring real time with events triggered** in case of Breach of Vaccine Temperature range.

- Provide **trustworthy Information** regarding the storage and handling of the Vaccine from manufacturer till it reaches the Patient thereby build trust .

- Recorded Data and events can be pulled to track the vaccine information by scanning QR Code giving **transparency** to Vaccine Coldchain.

Vaccines Coldchain on Blockchain

Author(s): Rishi

The problem being addressed

- CDC says - It is better to not vaccinate than to administer a dose of vaccine that has been mishandled. Vaccines must be stored properly from the time they are manufactured until they are administered. Storage and handling errors problem:
- decrease potency and reduce effectiveness and protection
- cost thousands of dollars in wasted vaccine and revaccination
- loss of patient confidence

Stake Holders Involved

- Patients
- Vaccine Manufacturers
- Distributors
- Hospitals
- Public Health Staff

Proposed Solution

- Enable a solution shared between all the stake holders, by using the following features in the solution:
- Temperature and Location/GPS sensors are equipped with each pallet (batch of vaccines) that needs to be tracked
- A temperature threshold is set (typically between 2 degrees to 6 degrees)
- When there is a deviation the breach is written to a distributed ledger, in case of sporadic network coverage the data is stored offline on the device that is sending this information
- The data from these sensors are continuously transmitted to a Cloud based solution to optimize storage and pull analytics

Applicable Industries

- Pharmaceutical

Benefits

- Various stake holders are brought onto same platform by using a solution that is made generally available
- Patients can have increased trust in the cold supply chain and can rest assured that they don't get mishandled vaccines
- Any data about health cannot be risked hence storing and connecting this infrastructure makes a lot of business sense

Competitors

- CDC

Business Model Canvas

IOTA

Key Partners ? Insert

- Healthcare providing organisations (Hospitals)
- Private Doctors
- Patients
- Medical staff (Lab specialists, technicians) etc

Key Activities ? Insert

- Develop the Blockchain layer and Architecture
- Develop Application
- Onboarding Hospitals and Insurance Providers for Network effects

Key Resources ? Insert

- Network effects of large number of organisations on the chain
- Our Team's capabilities

Value Proposition ? Insert

- Digitised, immuatble storage of medical records
- Access to patients medical records from other organisations
- Provide Immutable Data for Insurance Claims
- Ability to provide better quality and quicker care

Customer Relationships ? Insert

- IT and Blockchain Service

Channels ? Insert

- Website
- Apps
- Partnerships

Customer Segments ? Insert

- Hospitals, Clinics, Private Doctors
- Research Centers
- Insurance Companies

Cost Structure ? Insert

- Initial Investment and Subscription Costs

Revenue Streams ? Insert

- Usage Fees
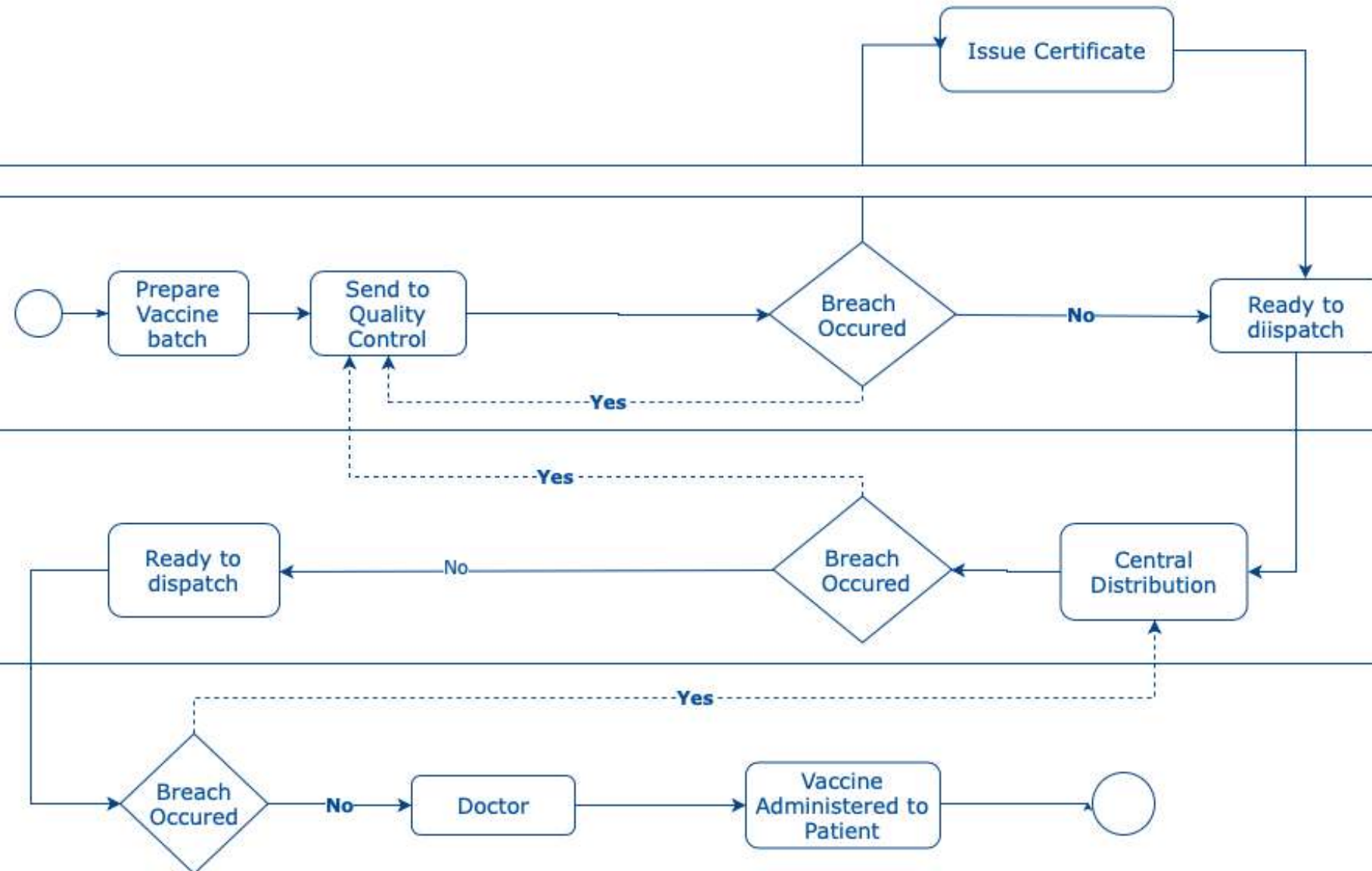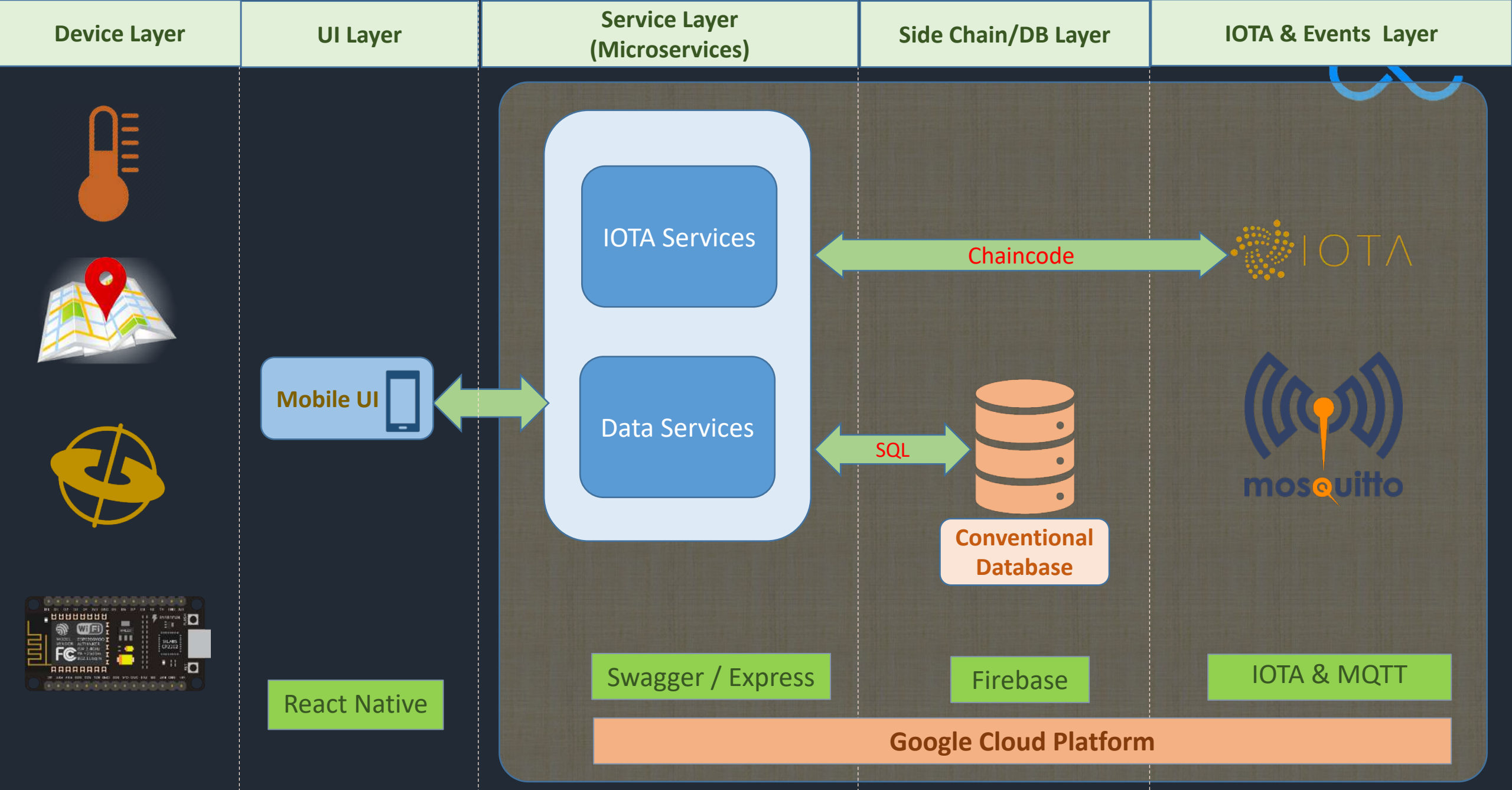- Maintenance & Service Contracts

Vaccine ColdChain - Process Flow

Device Layer	UI Layer	Service Layer (Microservices)	Side Chain/DB Layer	IOTA & Events Layer

IOTA Services

Data Services

Chaincode

SQL

Conventional Database

IOTA

mosquitto

Mobile UI

Swagger / Express

Firebase

IOTA & MQTT

React Native

Google Cloud Platform

ColdChain – Layered Architecture

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GOVERNMENT OF TELANGANA

bradsol
SIMPLIFYING BUSINESS

iDEALABS