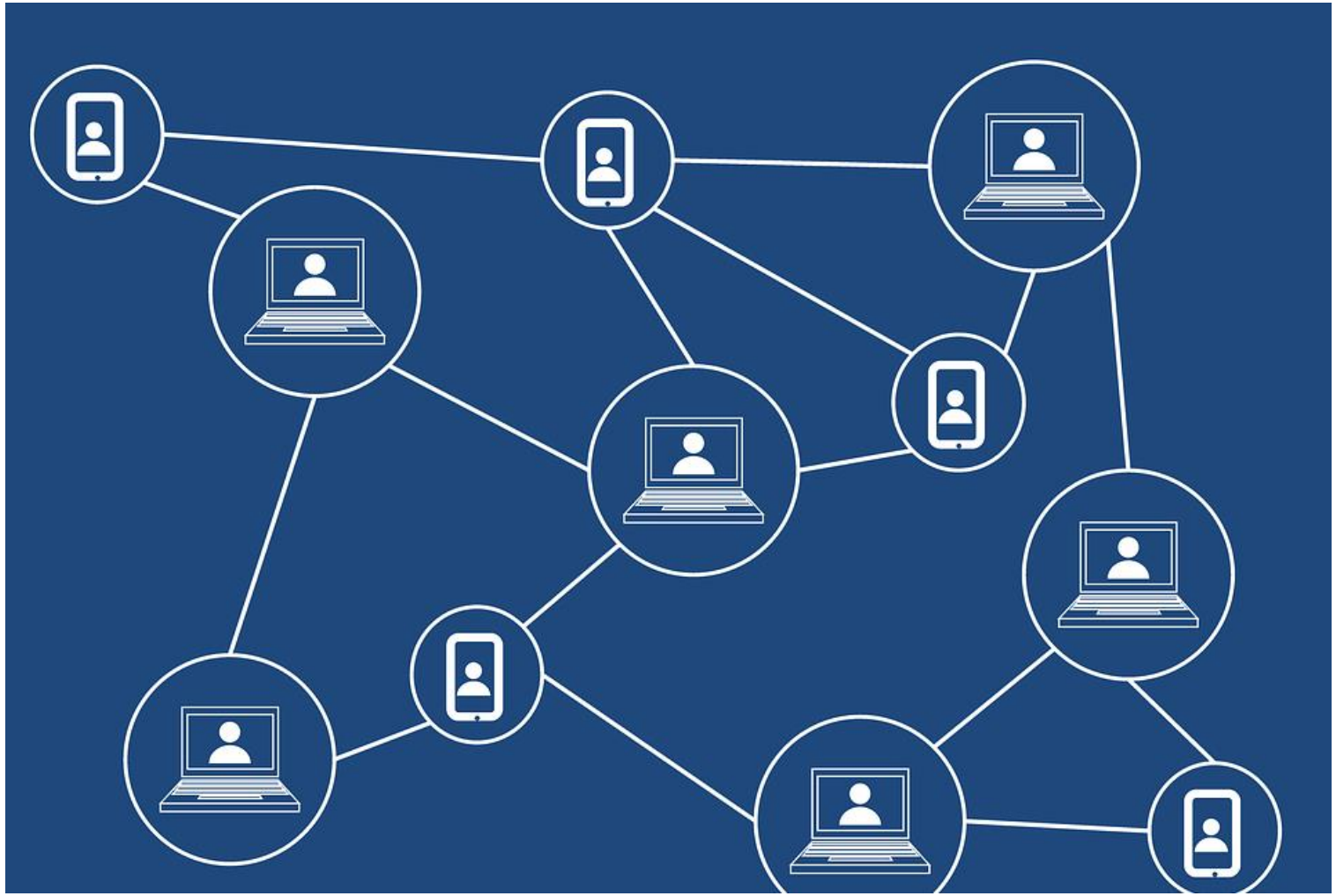


BLOCKCHAIN

How digital disease surveillance systems could have prevented the Delhi dengue outbreak

If the government wants to prevent large scale outbreak of diseases in future, it needs to consider leveraging disease surveillance systems that rely on digital/social media.

Wednesday, September 28, 2016 - 16:53

By Dr. Vikram Venkateswaran

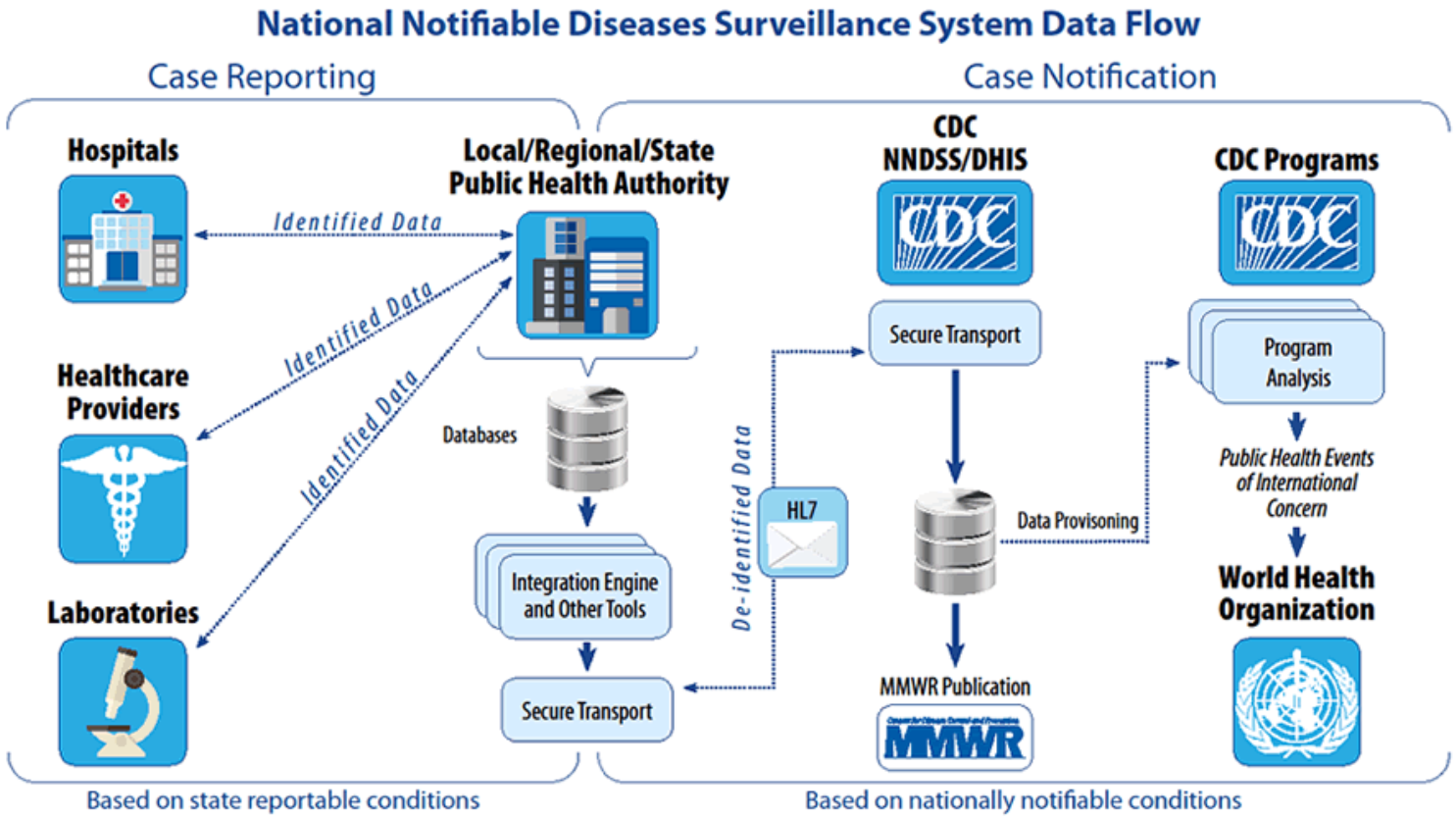
India is perhaps the only country in the world (of its size) where addressing preventable diseases continues to drain public resources. The Delhi dengue outbreak is a case in point. This is the third or fourth time in a decade (the first being in 2006) that the city has failed to prevent the spread of this disease. Close

Disease Surveillance

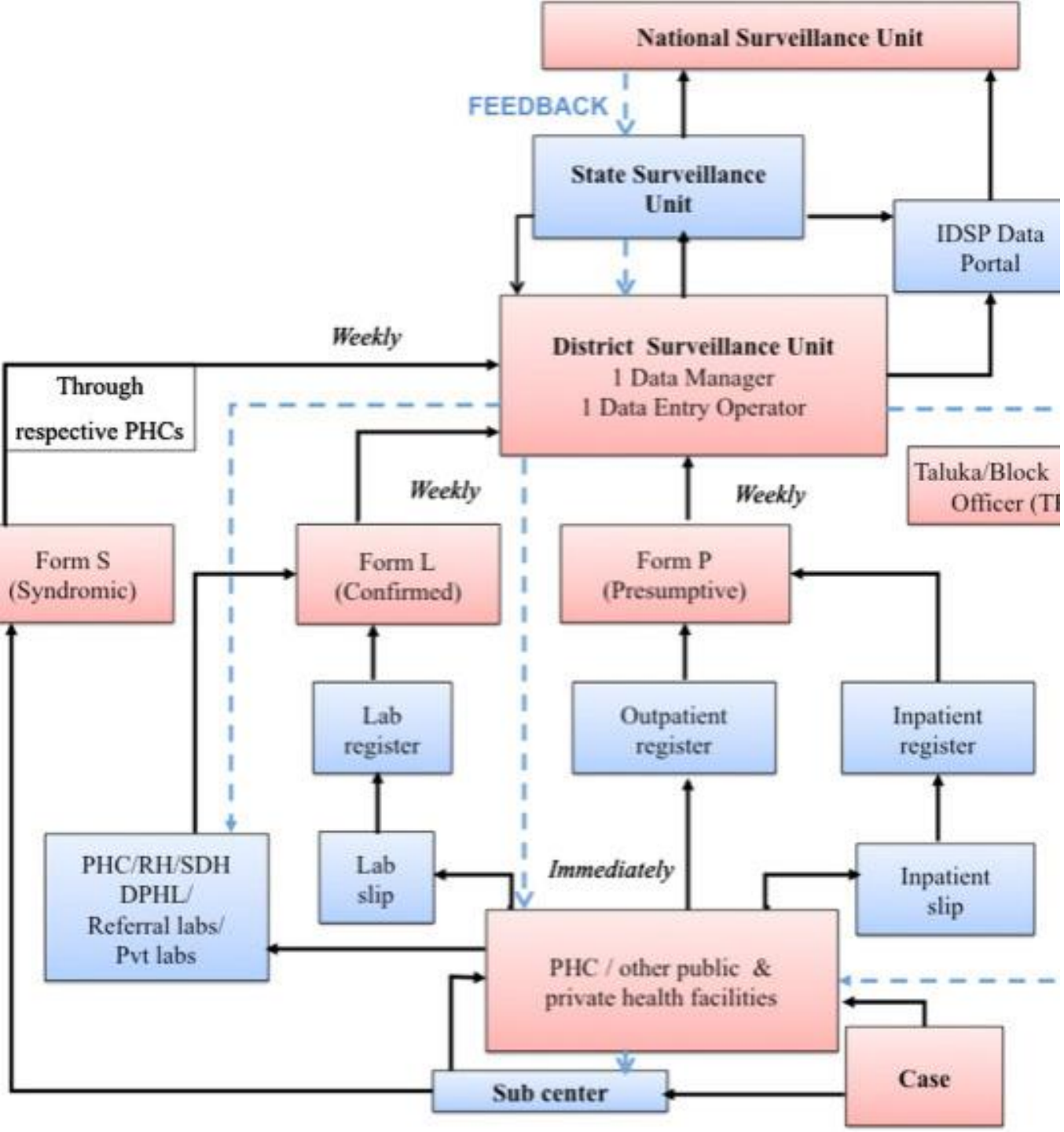
Gem

The enterprise blockchain company

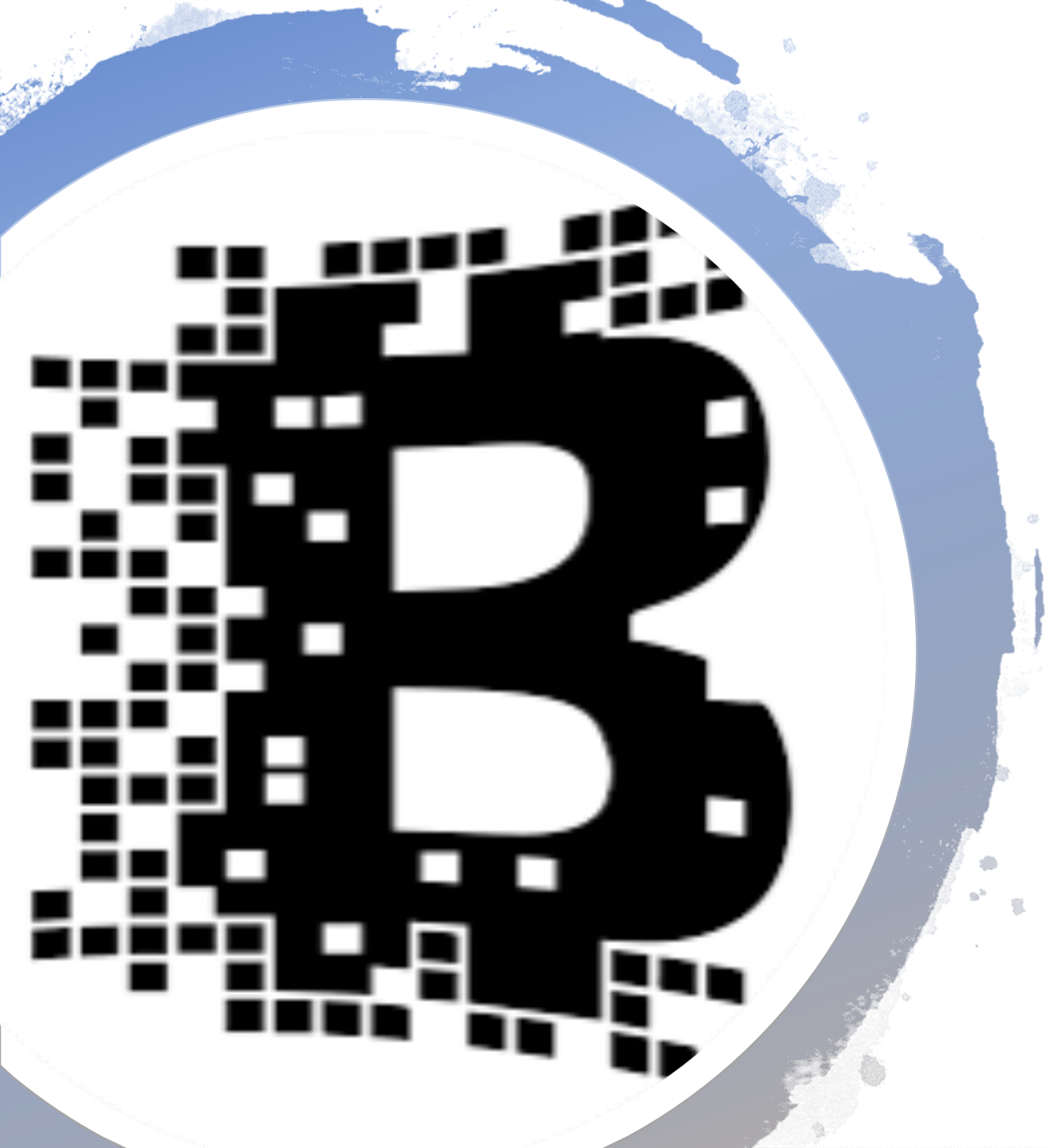
How the CDC works?



Source: HHS



ISDP – Integrated Disease Surveillance Program in India



BLOCKCHAIN HAS THE POTENTIAL TO TRANSFORM HEALTHCARE IN INDIA

Proposed model on the Blockchain

- A model, in which every village hospital, City hospital, district hospital and Government department is connected to each other.

Patient

Infection Details + Time, Place etc.

PHC

Patient Details + PHC Details + Doctor Info + Initial medication

District Hospital

PHC Information + Ward Infor + Medication Details + Staff details.

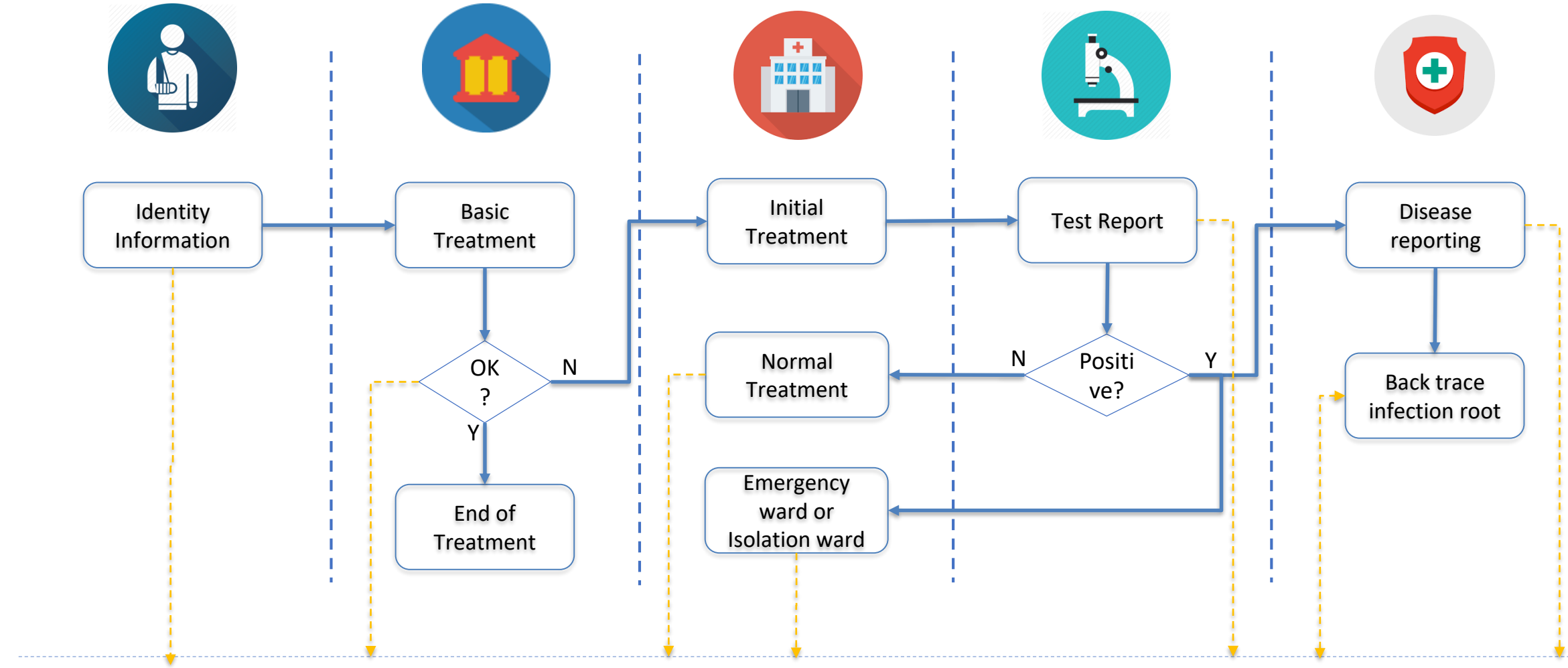
Lab.

Patient Info + Hospital Info + Medication Info

Government Body

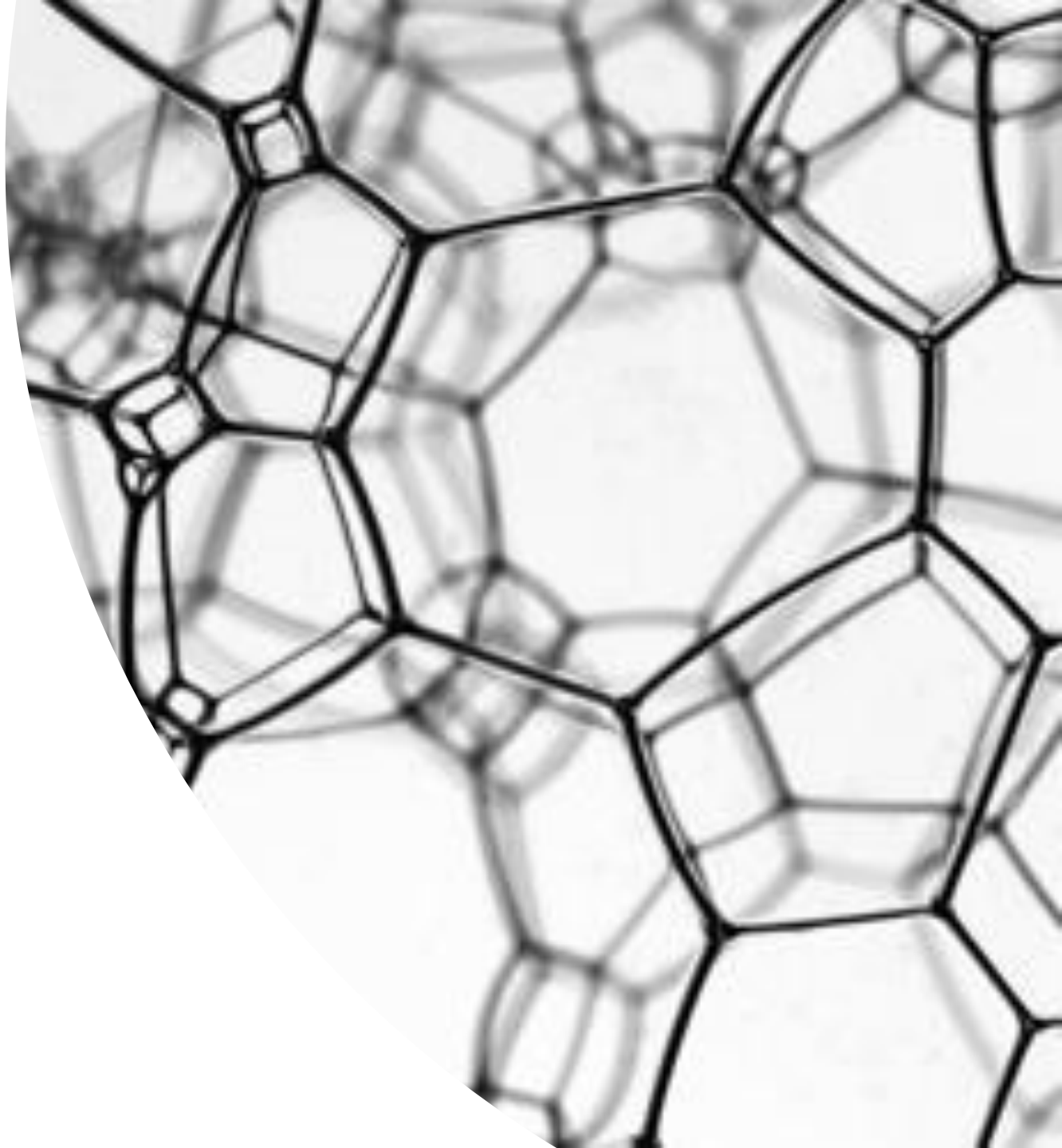
Patient Details + Medication Details + Other details.

Architecture Diagram



What's so great about it?

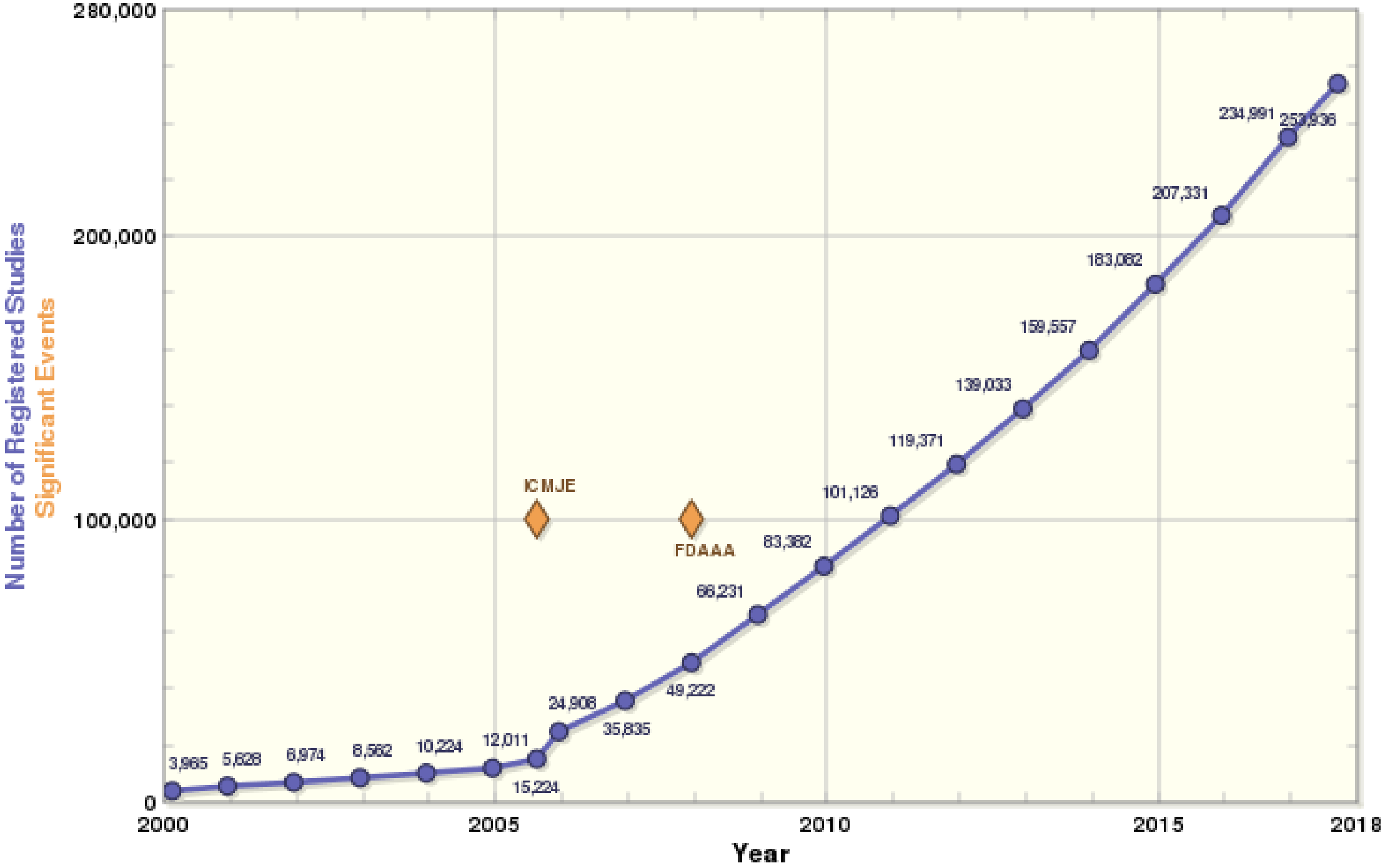
The ability to have a secure and trusted audit trail of information in real time means block chains inherently improve regulatory compliance, and can spot red flags immediately.



High Data Sharing Costs

US healthcare organizations spend about USD 93 Billion in 5 years in data sharing costs.

Clinical Trials


Number of Registered Studies
Significant Events
280,000
200,000
100,000
0
2000
2005
2010
2015
2018
Year
ICMJE
FDAAA
3,965
5,628
6,974
8,562
10,224
12,011
15,224
24,906
35,835
49,222
66,231
83,382
101,126
119,371
139,033
159,557
183,082
207,331
234,891
253,936

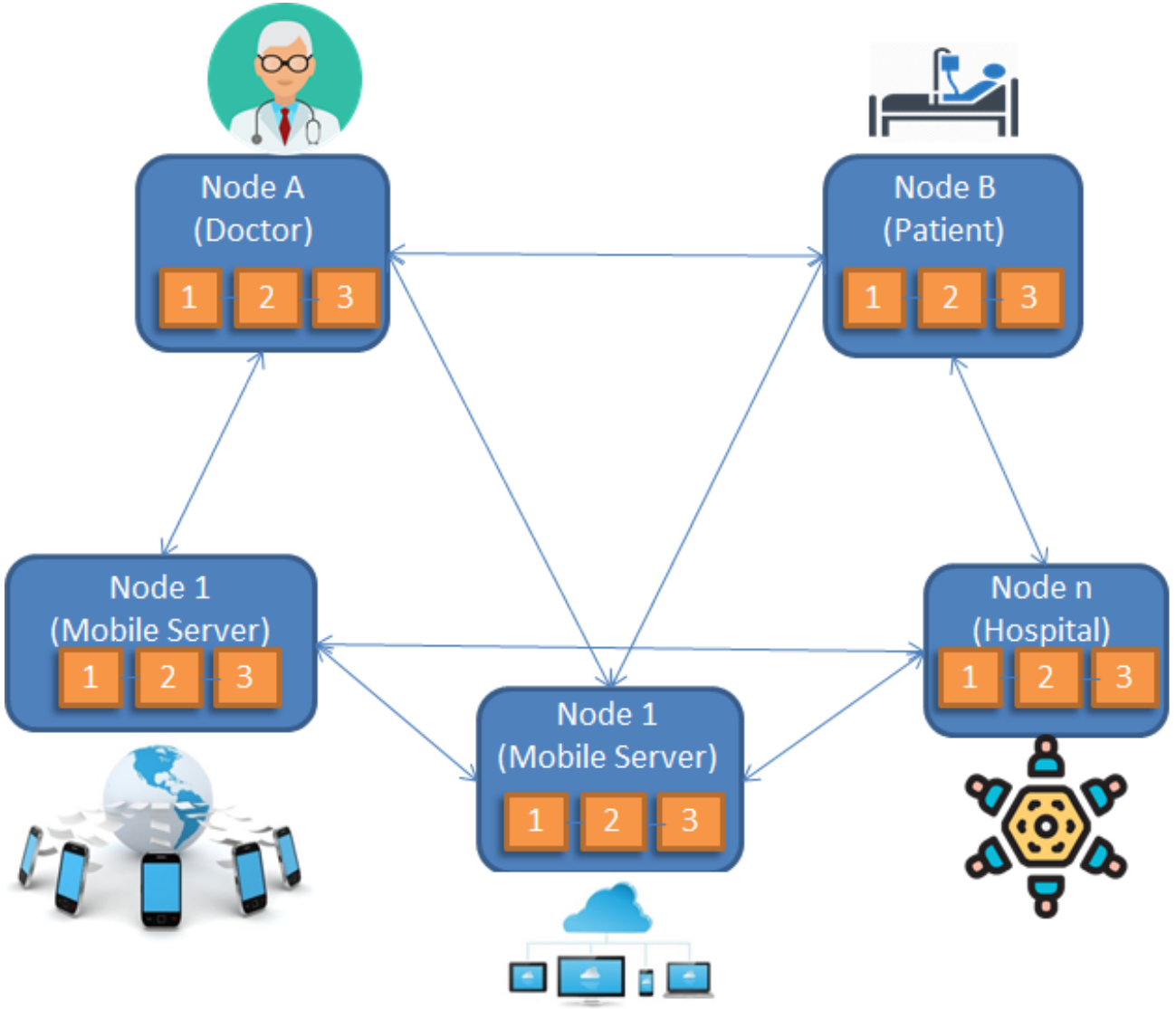
Anti Drug Counterfeiting

25% of the medicines in India are fake

Electronic Medical Records

Post operative care

HealthChain by Priyank Jani



The workflow in detail

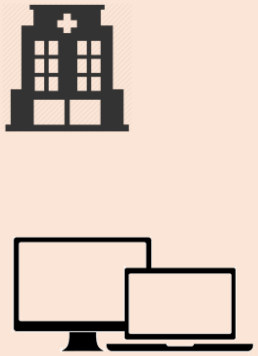
Health Organizations direct information to the Blockchain

1

Health organizations provide services to patients

Clinical data is tracked in existing health IT systems

Standard data fields and a patient's public ID are redirected to the Blockchain via APIs



Transactions are completed and uniquely identified

2

Each transaction is stored on the Blockchain, containing the patient's public (non – identifiable) ID

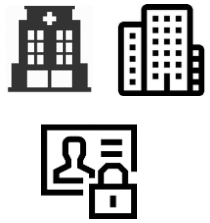
Smart contract process incoming transactions

Health Organizations and institutions can directly query the Blockchain

3

Health organizations and institutions submit their query via APIs

Non Identifiable patient information (e.g. age, gender, illness) is viewable



Data can be analyzed to uncover new insights

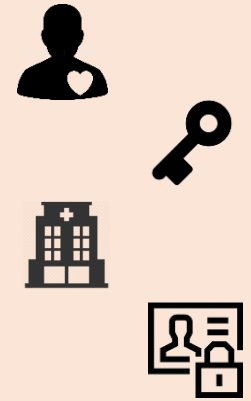
Patient can share their identity with health organizations

The patient's private key links their identity to Blockchain data

The private key can be shared with new health organizations

With the key organizations can then uncover the patients data

Data remains non-identifiable to those without the key



4

Source : Inovecs

Medical Labs might be the first to get integrated in the hospitals

Contract Management

Challenges ahead

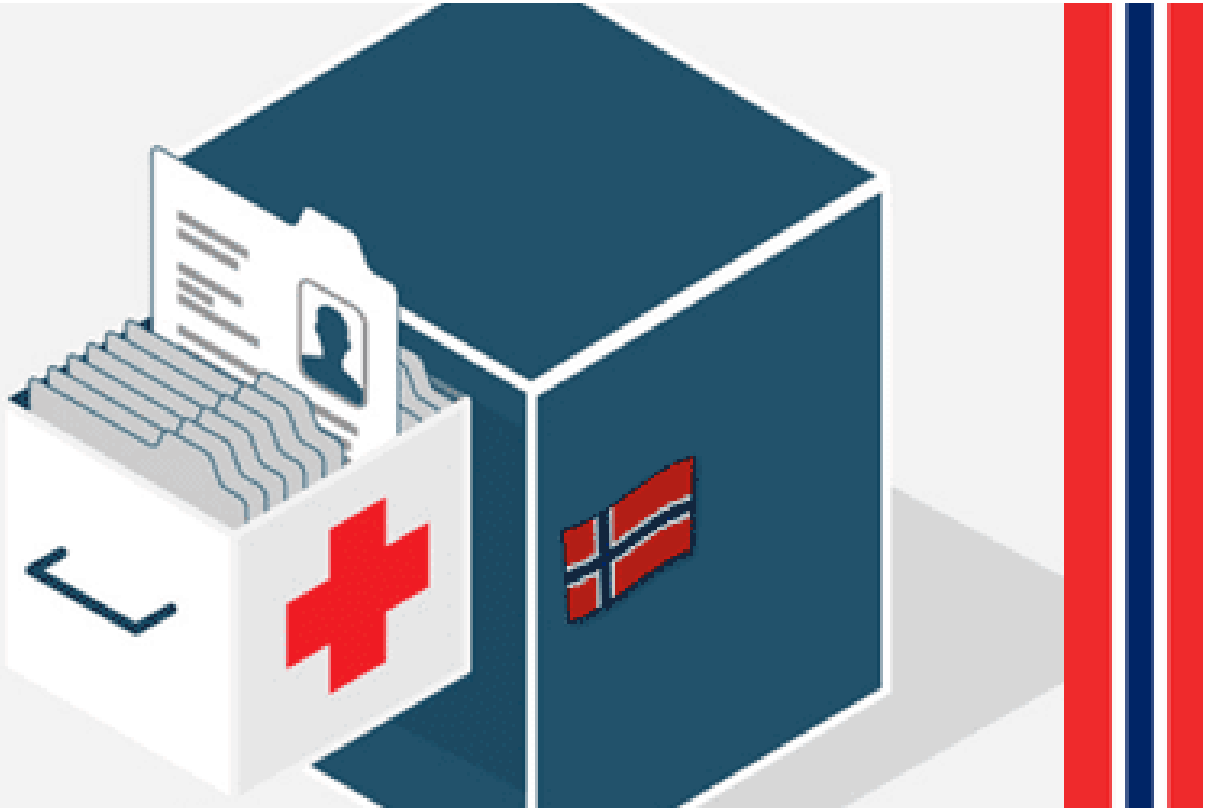
Blockchain is a foundational technology

Regulations

Norway

Massive HealthCare

Data Breach



Cyber Security

Estonia leads the way in healthcare blockchain

Key challenges summarized – Blockchain adoption in healthcare

1 ***Scalability Constraints***

- Tradeoffs between transaction volumes and available computing power
- Technology needs to evolve to allow faster processing times

2 ***Issue in Standardization of Data and Scope***

- To standardize data stored on the Blockchain , organizations should align on a framework for defining what data, size, and format of data can be submitted

3 ***Adoption and Incentives for Participation***

- Two levels of incentives are necessary for Blockchain to succeed, One on technical level, more nodes to be present to supply computing power & secondly encourage organizations to participate in shared technology

4 ***Costs of Operating Blockchain Technology***

- Consumes significant computing power to process transactions.
- Cost of computing power is derived from the volume and size of transactions submitted through the network

5 ***Regulatory Considerations***

- Since it is still in initial evolution stages, it might be difficult to ensure that growth of ecosystem is within the boundaries of existing regulatory framework

Megatrends impacting block chain and implications for the future

Limited digitization of data is a hurdle for block chain adoption
Relative slow pace of evolution of regulatory standards – Japan and Estonia are among some nations who have passed regulation to put money on Blockchain
Limited interoperability standards
Volatility in bitcoins – One of the many cryptocurrencies on a block chain platform
Patient access to data is contentious in many jurisdictions
Limited awareness of block chains is an entry barrier for organizations to explore this technology.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