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PRACTICAL BLOCKCHAIN /HEALTH

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1/
MORE INFORMATION — MORE CONCERNS

CONCERN /
IT IS DIFFICULT TO KEEP DATA LOCKED UP

TIME

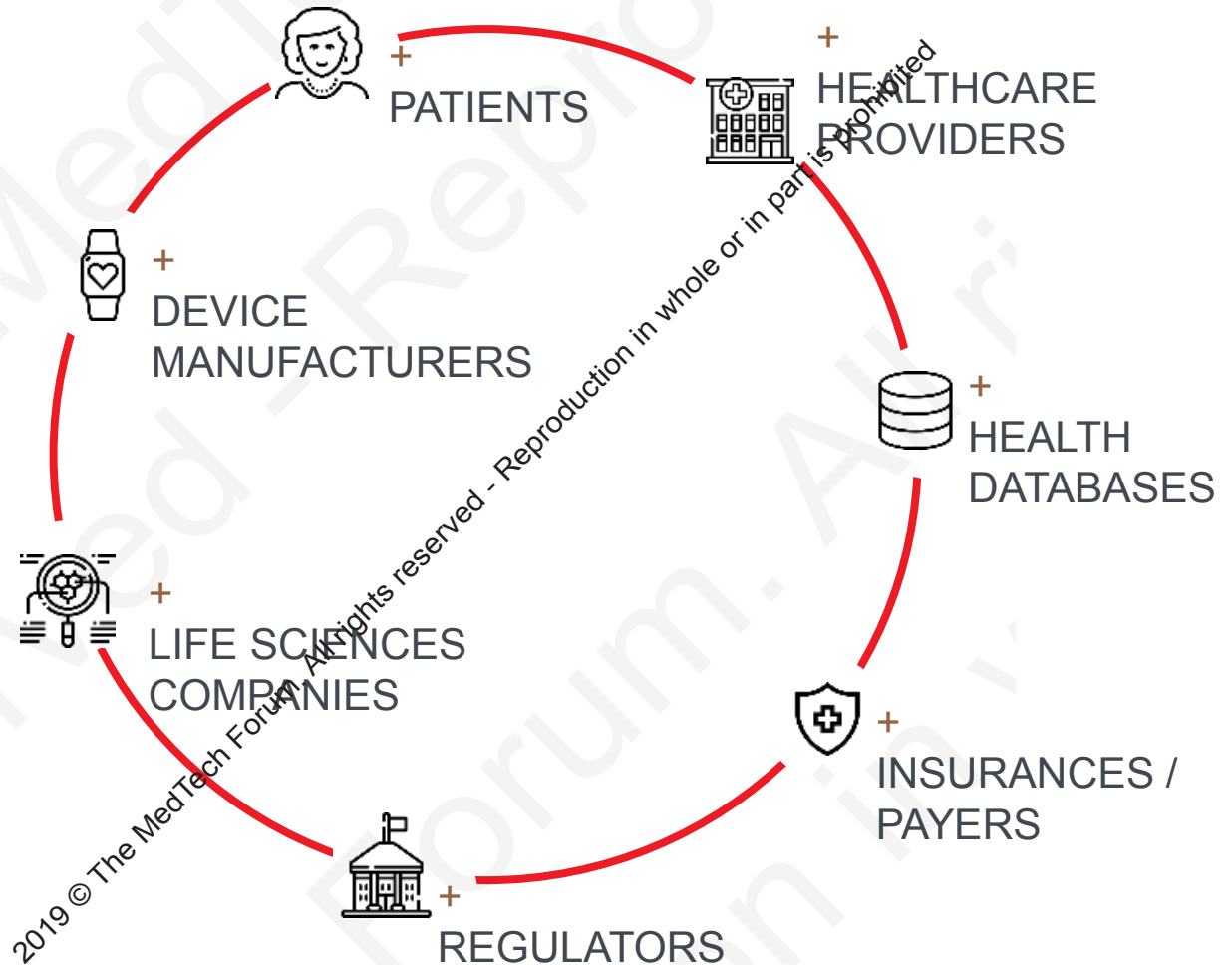U.S.   POLITICS   WORLD   TECH   ENTERTAINMENT   SUBSCRIBE

HEALTH • GENETICS

A Major Drug Company Now Has Access to 23andMe's Genetic Data. Should You Be Concerned?

BY JAMIE DUCHARME   JULY 26, 2018

CONCERN /
COMPLEX INTERACTIONS REQUIRE MULTIDIMENSIONAL DATA PROCESSING, WHICH IS UNCOMFORTABLE IF NOT TRANSPARENT

+ For good health outcomes real time access to the data to corroborate the **adherence of medication/treatment across multi-chronic conditions** in a multi-stakeholder ecosystem is a prerequisite

+ For health system sustainability **paying by outcomes** and **generating new knowledge** from the captured data is necessary and only works under multiple stakeholder approach

+ PATIENTS

+ HEALTHCARE PROVIDERS

+ HEALTH DATABASES

+ DEVICE MANUFACTURERS

+ LIFE SCIENCES COMPANIES

+ INSURANCES / PAYERS

+ REGULATORS

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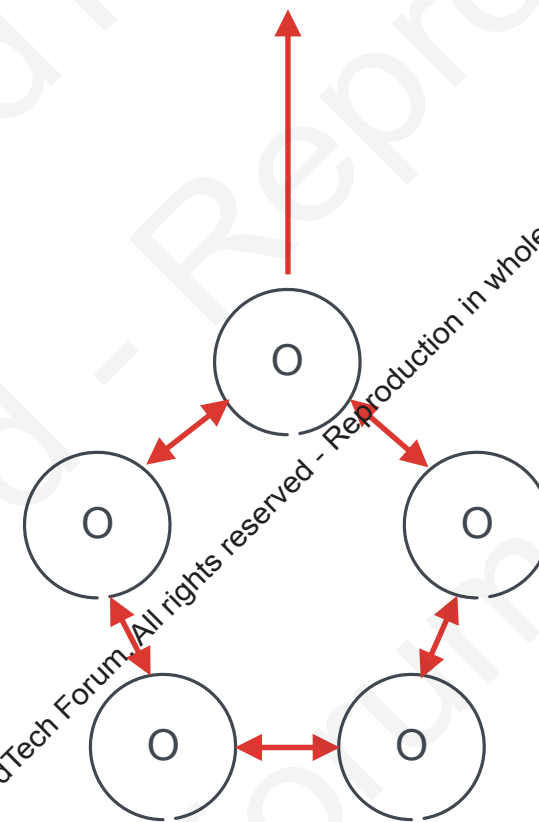# BLOCKCHAIN FREES TRUST FROM INSTITUTIONS

BLOCKCHAIN /
DISINTERMEDIATED TRUST MACHINE

/BLOCKCHAIN

is a distributed database that maintains a continuously growing list of data records, chained together against revision and tampering.

/DISTRIBUTED CONSENSUS

is an agreement between different compute-nodes over what is a true or false record.

BLOCKCHAIN IS USEFUL FOR PRACTICAL PROBLEM SOLVING

/PROVIDE PROOF OF WORK

Integrated & automated supply-chain / clinical workflows

/GUARANTEE DATA INTEGRITY

Clinical quality & integrity
Financial integrity

/SUPPORT PREFERRED ECONOMIC MODEL

Outcome-based incentives

BLOCKCHAIN™
IN
HEALTHCARE
TODAY

Real Blockchain Use Cases for Healthcare

Halamka, J. (2018)

2007:
WORLDS FIRST STATE SPONSORED CYBER ATTACK

THE CHALLENGE:

Prove the time, integrity and origin/provenance (human or machine) of any electronic data asset, without reliance on centralized trust authorities.

2008/2012:
KSI BLOCKCHAIN HIGHLIGHTS

Signature platform – customer sends asset's hash, receives a token which proves participation in the blockchain.

Data NEVER leaves customer premises (only hash is sent to KSI service) – privacy guaranteed!

KSI Signature proves:

+ Asset Integrity
+ Signing Time
+ Signing Entity

KSI
BLOCKCHAIN

DATA   HASH   KSI SIGNATURE

CUSTOMER
ENVIRONMENT
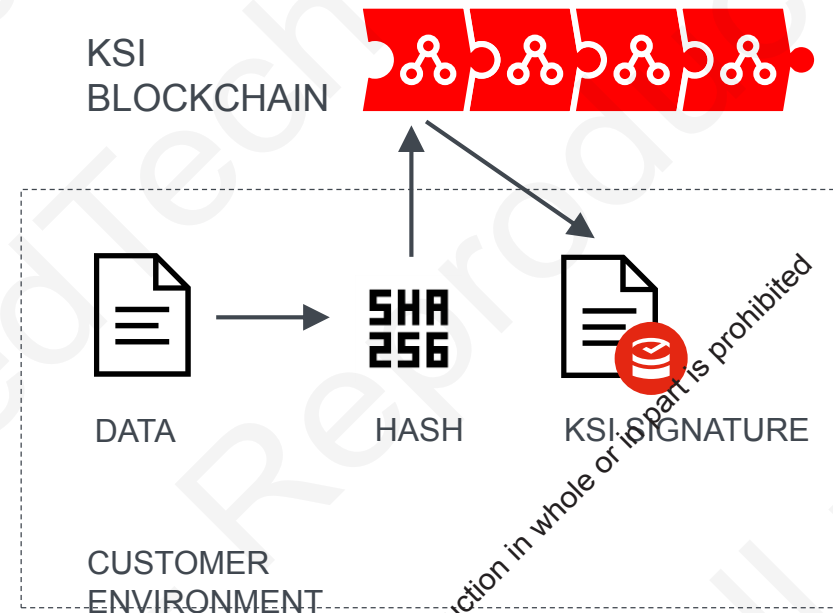
KSI Blockchain Benefits:

+ Signatures independently verifiable by any 3rd party
+ Do not expire, provide long-term forensic proof
+ Overcomes technical limitation of other blockchain technologies (commitment time, scalability etc)

DATA AND PROCESS GOVERNACE IS BEST TO KEEP IN SEPARATE TECHNOLOGICAL LAYERS

CONFIDENTIALITY

ID-card & Mobile-ID
Smart ID, e-Residency

AVAILABILITY

X-ROAD

INTEGRITY

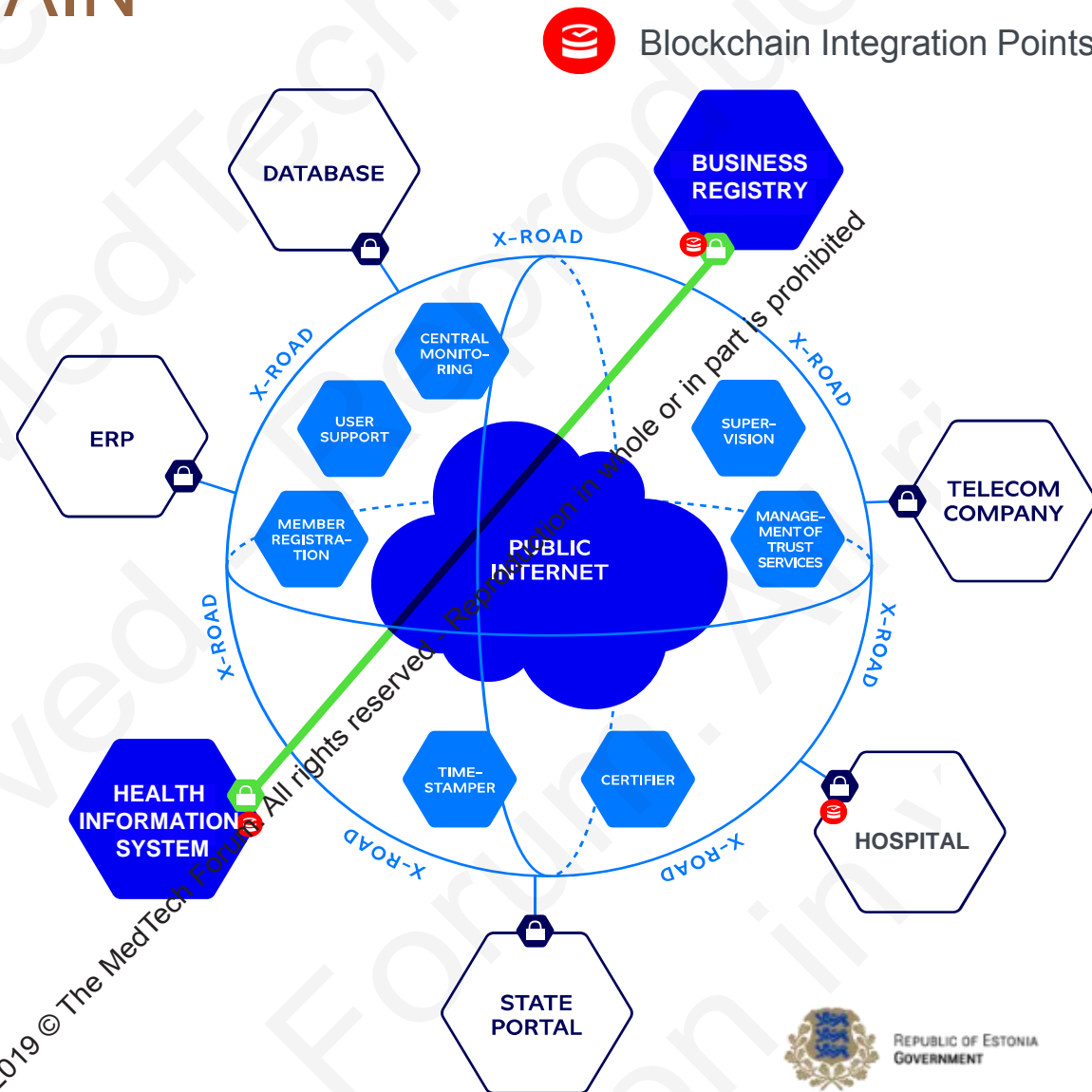KSI Blockchain

the context in ESTONIA

ESTONIA: DECENTRALISED GOVERNMENT DATA BACKED BY BLOCKCHAIN

Blockchain is implemented as an independent integrity layer throughout Estonian Government Networks.

Network Segregation of Government Departments.

There is complete transparency and accountability between citizens and government

+ Health Information System

+ Property and Land Registry

+ Business Registry

+ Succession Registry

+ e-Court

+ Surveillance / Tracking Information System + State Gazette
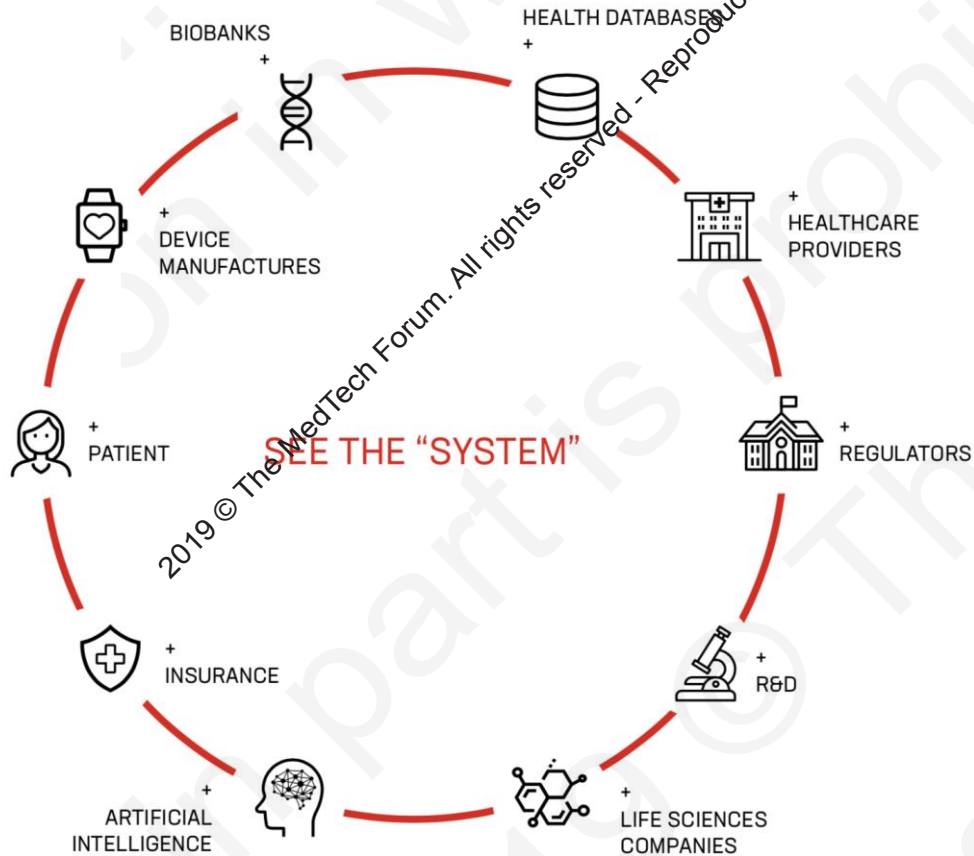
+ Official State Announcements

Blockchain Integration Points

DATABASE
BUSINESS REGISTRY
X-ROAD
ERP
CENTRAL MONITO-RING
USER SUPPORT
SUPER-VISION
MEMBER REGISTRA-TION
PUBLIC INTERNET
MANAGE-MENT OF TRUST SERVICES
TELECOM COMPANY
HEALTH INFORMATION SYSTEM
TIME-STAMPER
CERTIFIER
HOSPITAL
STATE PORTAL

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3/
BLOCKCHAIN-BASED SOLUTIONS CAN UNLOCK DATA & MAINTAIN TRANSPARENT OVERSIGHT

WHO OWNS THE DATA?/
PERHAPS A WRONG QUESTION…

BIOBANKS

HEALTH DATABASES

DEVICE MANUFACTURES

HEALTHCARE PROVIDERS

PATIENT

SEE THE "SYSTEM"
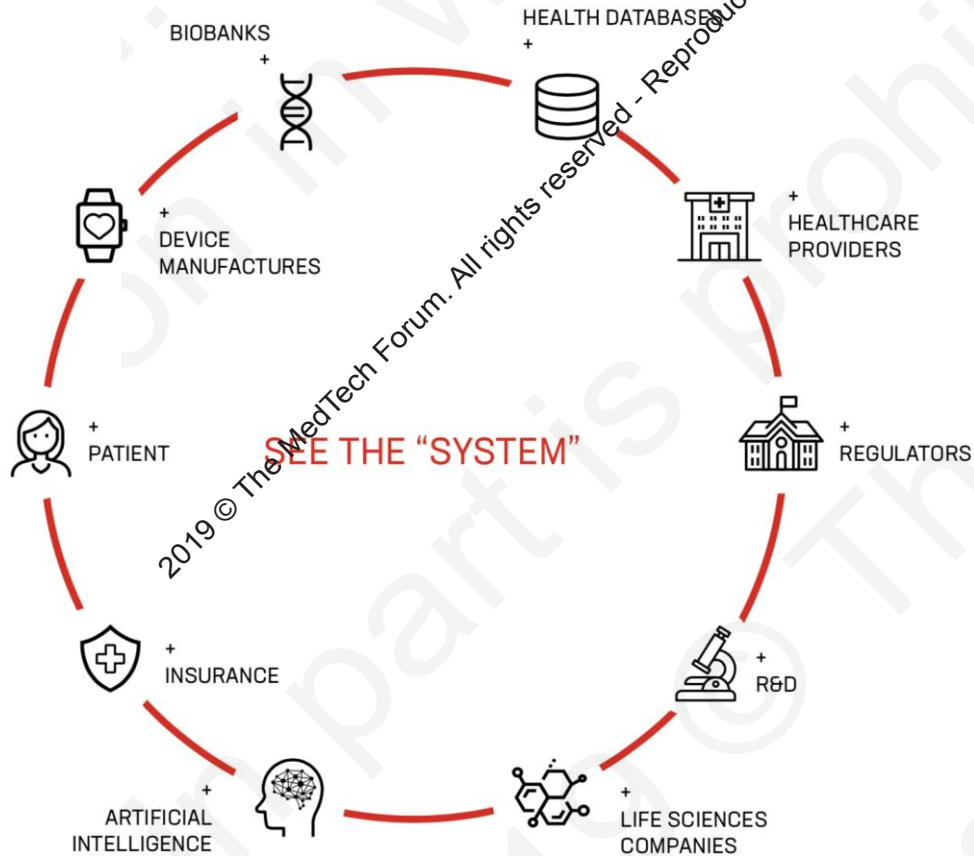
REGULATORS

INSURANCE

R&D

ARTIFICIAL INTELLIGENCE

LIFE SCIENCES COMPANIES

VARIOUS DATA-DRIVEN USE-CASES:

+ **Data access management** for (big data) analytics

+ Decentralized data access for **outcome based contracting**

+ Managing pharma **supply-chain accountability and visibility**

+ **Innovative clinical trials** patient recruitment follow-up and data management

+ Managing care quality with **digital infrastructure**

HOW TO CONTROL TRANSPARENT DATA USE? / PROCESSING ACCORDING TO THE PURPOSE

BIOBANKS +
HEALTH DATABASES +
DEVICE MANUFACTURES +
HEALTHCARE PROVIDERS +
PATIENT +
REGULATORS +
INSURANCE +
R&D +
ARTIFICIAL INTELLIGENCE +
LIFE SCIENCES COMPANIES +

SEE THE "SYSTEM"
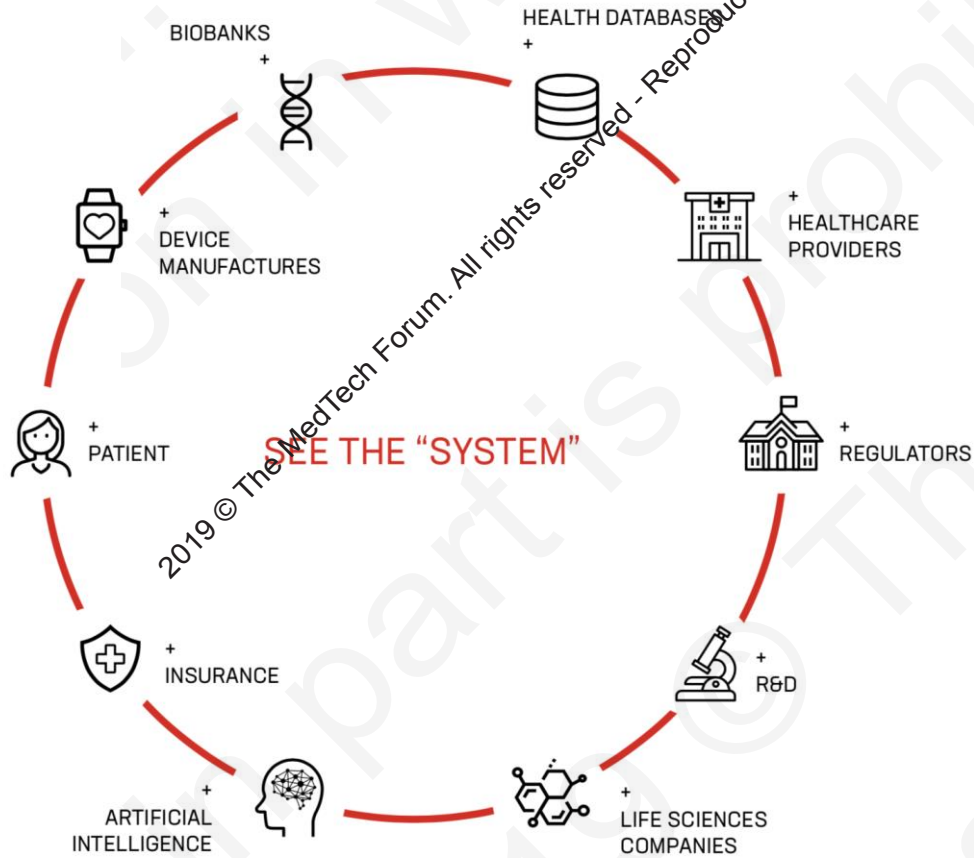
… REQUIRES FLEXIBLE APPROACH:

Data-liquidity (=data travels) for the exchange/sharing of personally identifiable health data and/or proprietary patient data. The cornerstone being patient consent.

Data-visibility (=data does not travel) describes the ability to provide summaries or specific aspects of health / patient data without revealing any original data.

Blockchain is used for immutable proof of what data came where and from, who* created it, who* used (or shared) it for what purpose.

* Human or a machine/algorithm

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BLOCKCHAIN-BASED SOLUTIONS /
UNLOCK DATA & MAINTAIN TRANSPARENT OVERSIGHT

BIOBANKS

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INTEGRITY BY BLOCKCHAIN

enables single version of truth about:

+ Provenance

+ Consent

+ Secure data exchange

+ Aggregated/secure analytical reporting

+ Identity mapping

+ Automated auditing

+ Automated process verification

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THANK YOU!

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