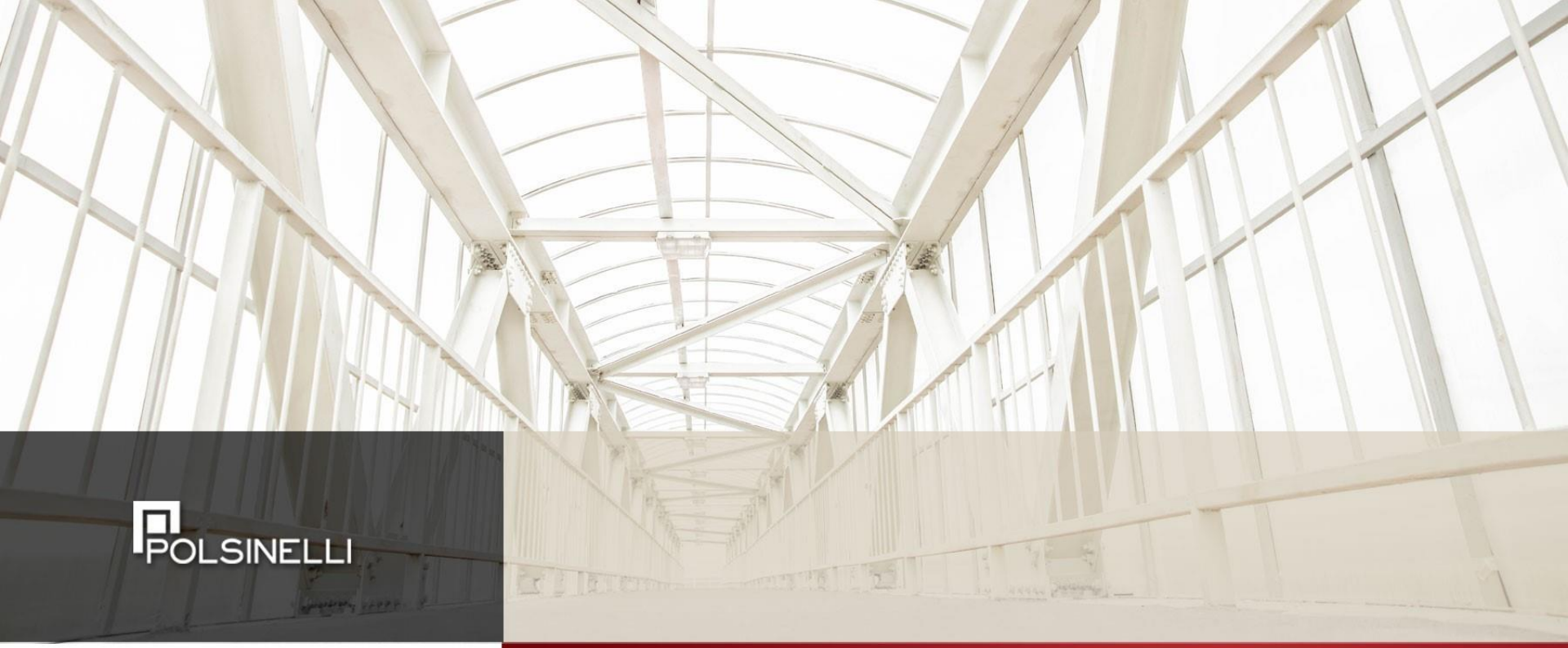

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DISCUSSION: BLOCKCHAIN TECHNOLOGIES IN HEALTHCARE

Blockchain Overview

a **database** (aka ledger)…

that is publicly **distributed**…

where data is stored by **consensus**

and **can't be changed**

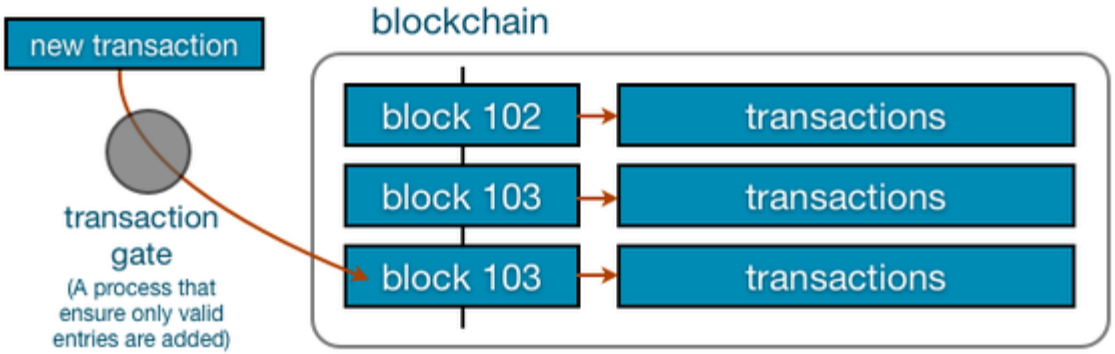
secure by modern **cryptography**

more than encryption

"computational hardness"

How blockchain works

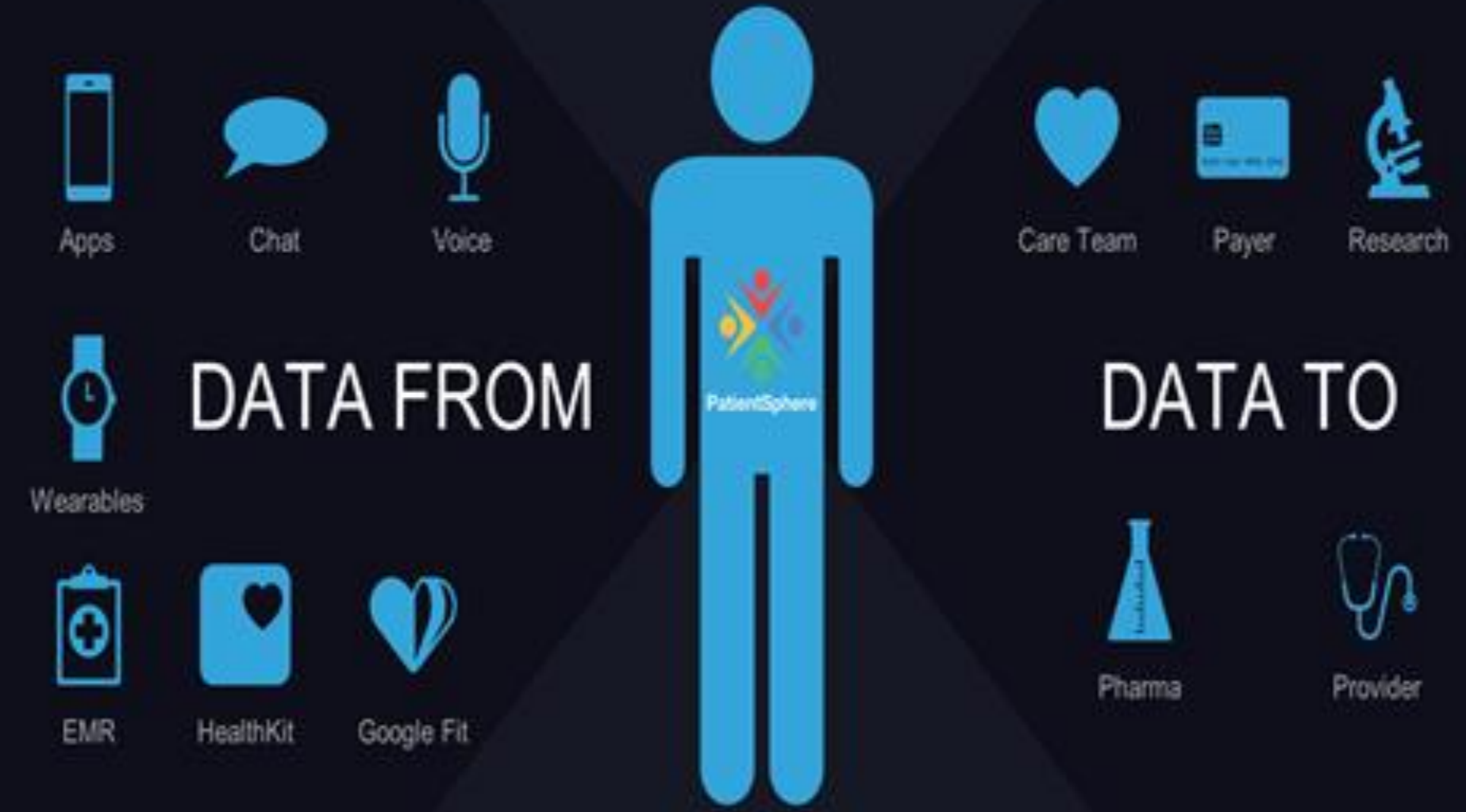
A blockchain is a database shared by every participant in a given system. The blockchain stores the complete transaction history of a cryptocurrency or other record keeping system.



Transactions aren't recognized until they are added to the blockchain. Tampering is immediately evident, and the blockchain is safe as record because everyone has a copy. The source of discrepancies is also immediately obvious.

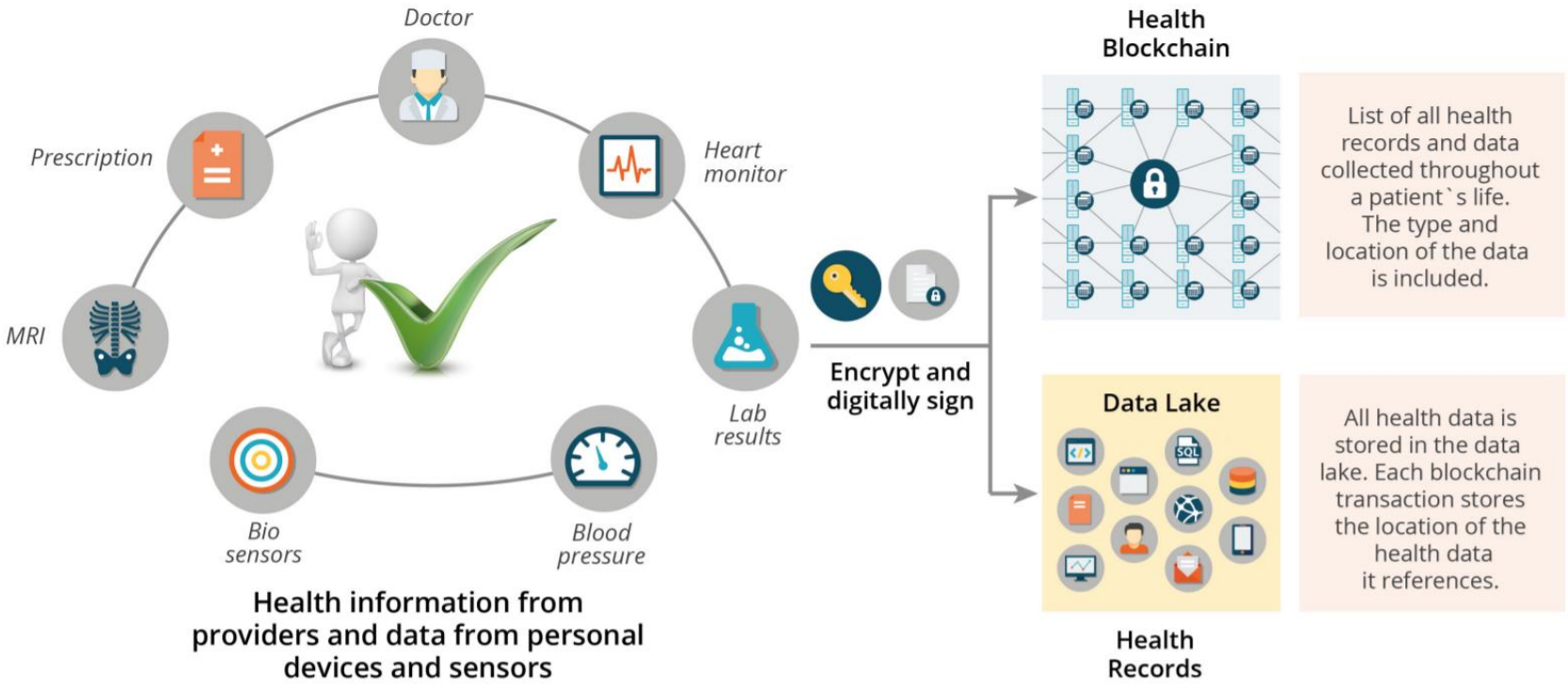
From http://zdnet.com/blog/hinchcliffe on ZDNet. by Dion Hinchcliffe

PATIENT CONTROLLED DATA SHARING



WHEN / WHAT / HOW

Ex. Proposed Health Care Blockchain



Source: Laure Linn & Martha Koo, "Blockchain For Health Data and Its Potential use in Health IT and Health Care Related Research."

Smart Contracts (Not Legal Agreements)

Coined by Nick Szabo, a computer scientist in *Smart Contracts: Building Blocks for Digital Markets* (1996)

self-executing
self-authenticating
immutable
reduces human factor
breach is expensive

Barriers to Blockchain in Healthcare

- Security and privacy
  - Access to protected health information by all members of a distributed network
- Scalability
  - Storage for health records, documents and images
  - Replicating health records for all members of network
- Interoperability