

Insight Driven Health

Blockchain: Securing a New Healthcare Interoperability Experience

ONC & NIST Use of Blockchain for Healthcare Workshop

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Introductions





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What is a blockchain?



Open Access – share same data



Consensus – record of transactions with systematic validation



Distributed Network – decentralized transaction ledger database



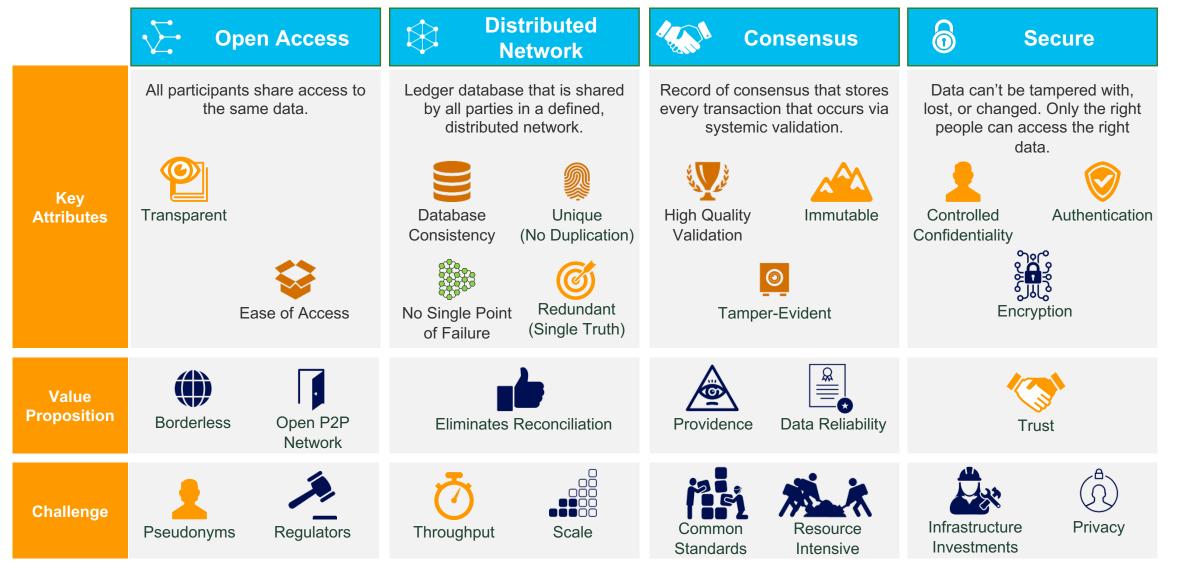
Secure – cryptographically secure

Some promising use cases for blockchain:

- Payments
- Clearing & Settlement
- Trade Finance
- Peer to Peer Networks (insurance, energy)

- Health Records Secured & Trusted
- Linking Identities
- Recording Patient Consent
- Health Revenue Cycle

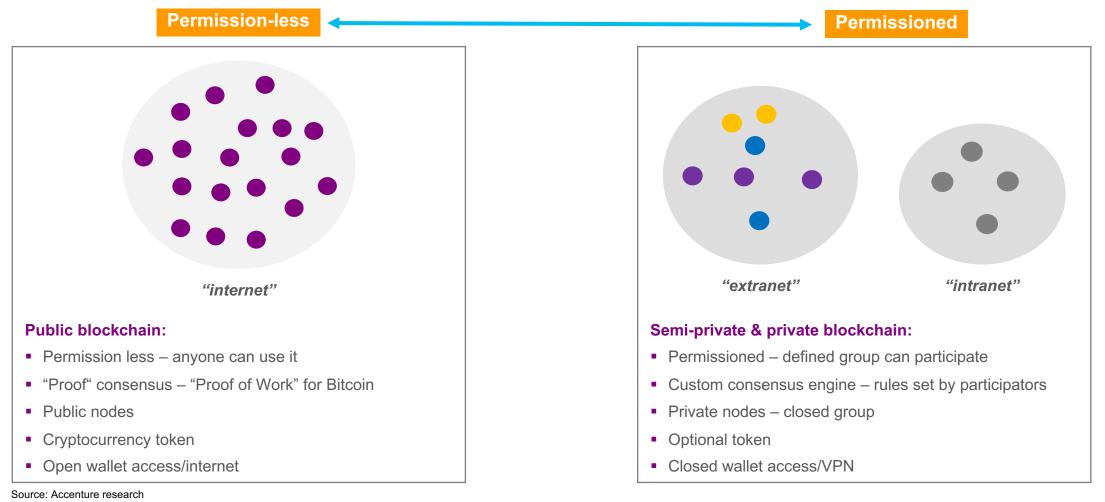
What are core principles of blockchain technology?



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What types of blockchain infrastructures are being implemented?

Semi- and fully-private Block Chains address concerns in privacy and permission management

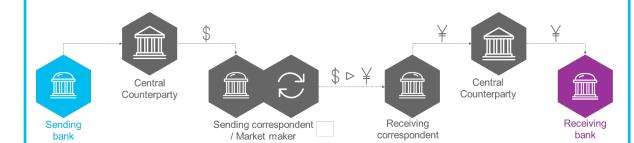


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Case Study: Bank to Bank Money Movement

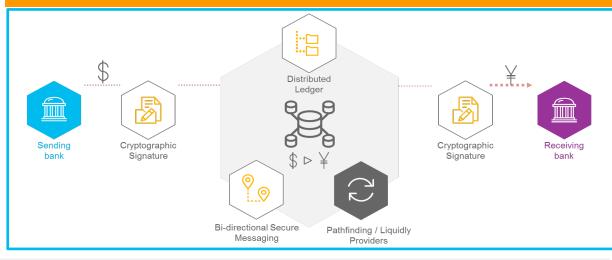
Moving Money Today:

clearing and settlement through one or more correspondent banks is slow, expensive and introduces counterparty risk



Moving Money Tomorrow:

direct clearing and settlement that reduces costs, delays and transaction risks



Limited visibility , fees and FX spread

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Payment notification in minutes; settlement overnight; batch processing

Intermediary charges processing fees; limited FX providers

Counterparty risk due to intermediaries and long processing time

Bank reserves provides liquidity; capital is tied up nostro accounts

Payment notification and settlement in seconds; processing 24/7/265

Full visibility into transaction status, fees and FX spread

No intermediary to charge processing fees; competitive FX rates

Counterparty risk eliminated by straight through, instant processing

Option of liquidly provider to fund transaction and reduce bank capital

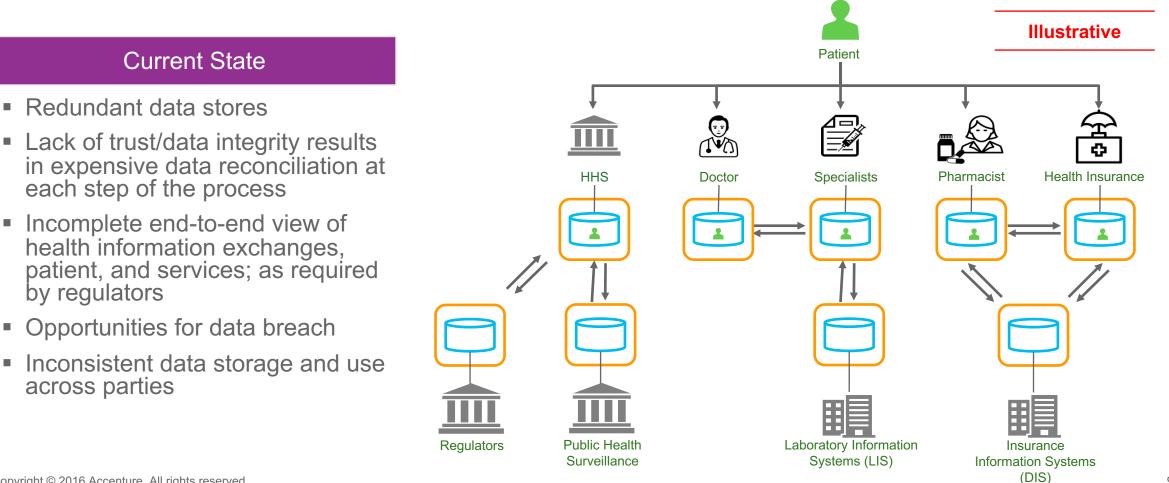
What are important applications of blockchain relevant to ONC's mission?

ONC Interoperability Roadmap Building Blocks

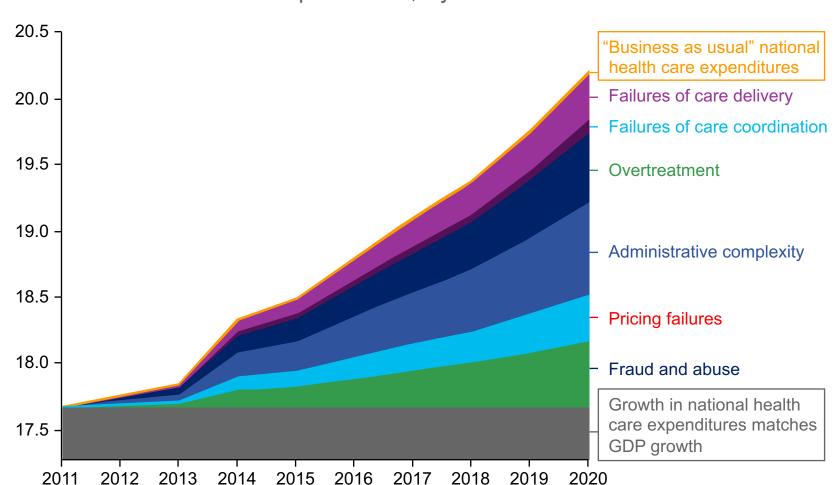


What is the current state of healthcare data exchange?

Data is spread in silos across multiple healthcare stakeholders for the purposes of executing a process which is often prone to discrepancies, expensive reconciliation and storage costs.



What are example costs associated with the current state?

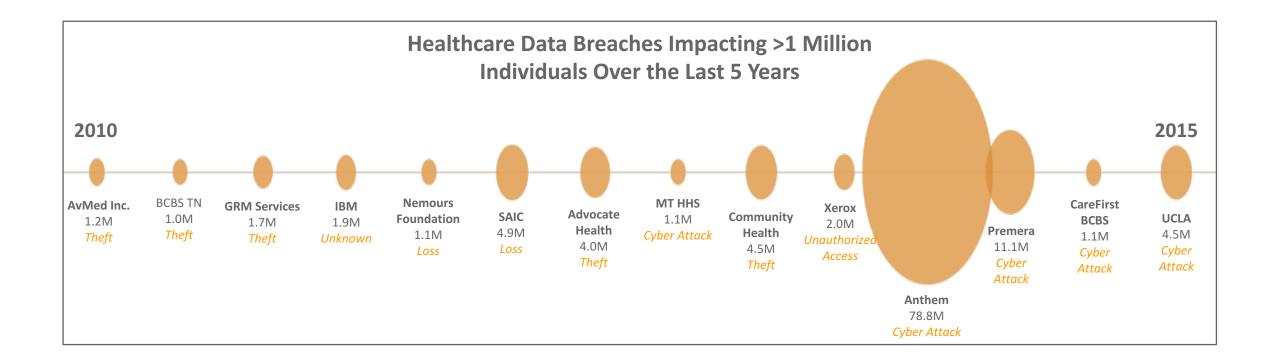


US National Health Care Expenditures, By Year as % of GDP

Source: Berwick, D. M. et al. JAMA April 11, 2012

What are example costs associated with the current state?

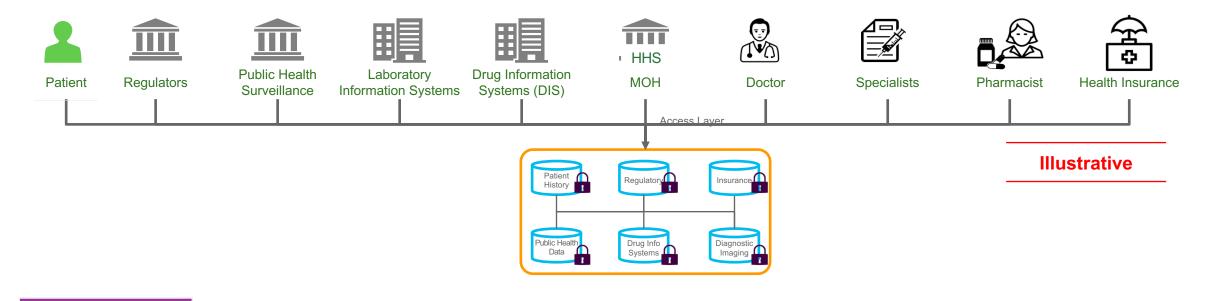
Number of healthcare data breaches impacting more than 500 individuals increased more than 40% over the past 5 years.



Sources: Accenture analysis based on data from the HHS Office for Civil Rights breach portal. Data accurate as of July 2015.

What is a potential target state enabled by blockchain technology?

A centralized view of the data across all parties would allow for access to relevant data, guarantee data integrity and significantly reduce reconciliation costs – permissioned blockchain on existing Health IT Investments

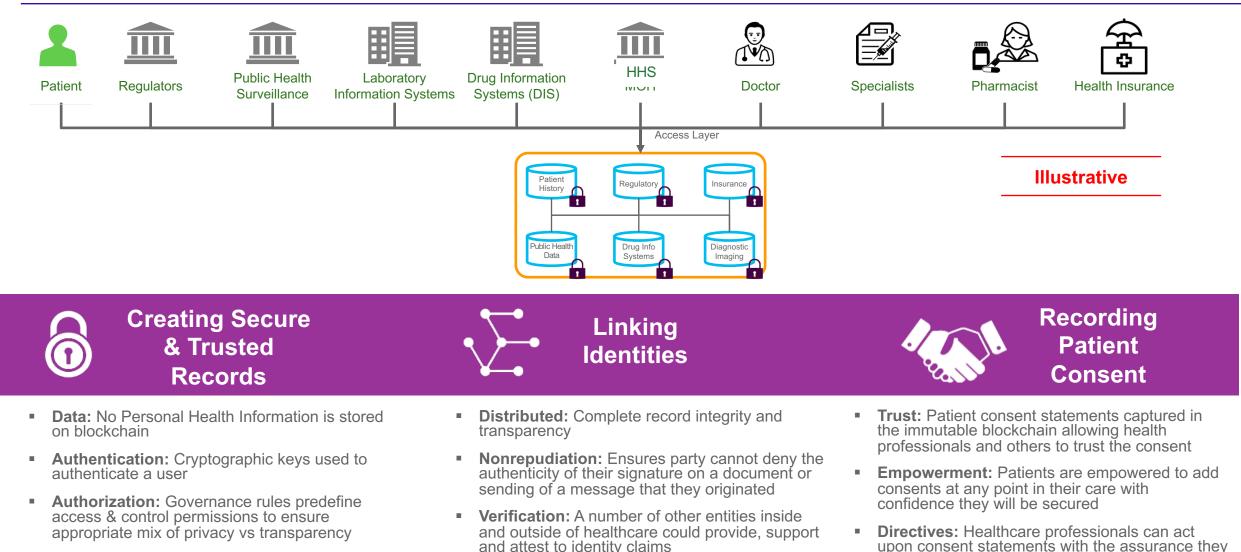


- Central store or "golden state" of data
- Guarantee data quality and availability
- Improved security (e.g., data-level encryption)
- Entitlement-based access

- Consistent data storage and use
- End-to-end view
- Auditability

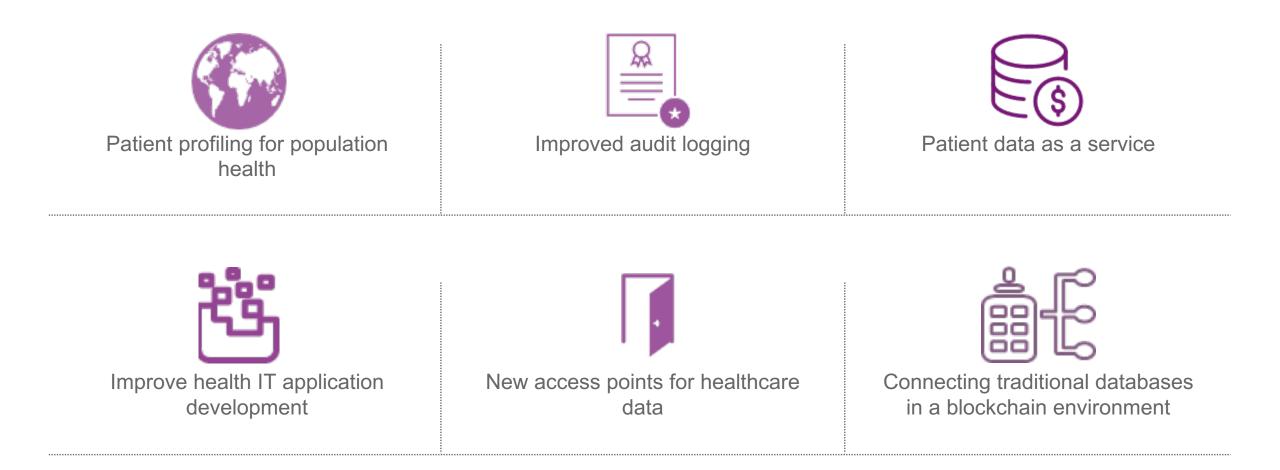
Target State

Summary of the three applications of blockchain relevant to ONC's mission



are adhering to patient wishes

What are other potential applications of blockchain technology in healthcare?



What are potential barriers to blockchain implementation in healthcare?

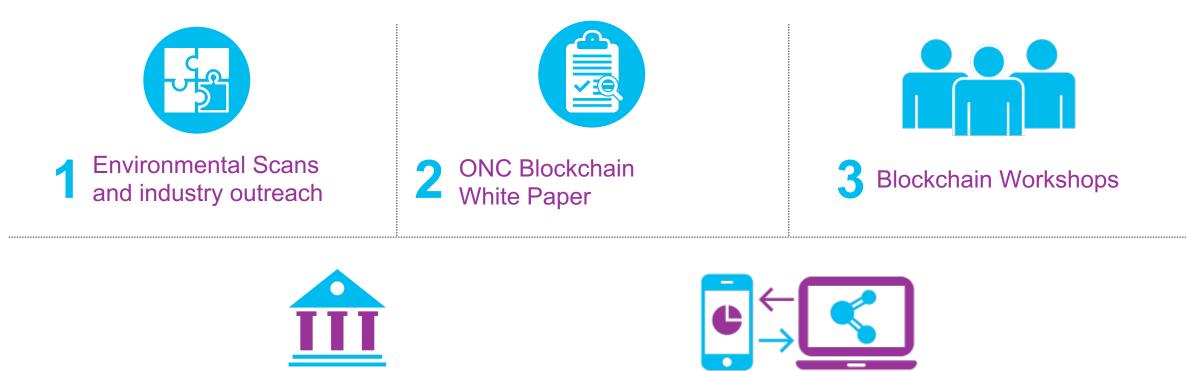
There are implementation barriers that must be overcome for blockchain technology to gain a legitimate place in the healthcare industry.

Barriers	
Regulatory	Redefining legal and regulatory frameworks to govern use of this new socio-political paradigm
Scalability	Finding solutions that can handle the required volume
Verification Speed	Determining optimal verification process to avoid latency over time as the data on the blockchain grows
Security Breaches	While blockchain protocol is stable and secure, supporting infrastructures have suffered from security breaches
(Å) Immutability	Governance models and solutions must exist for situations when users need to remove data from the blockchain, for privacy or legal reasons

Suggested Actions

What are suggested actions for ONC related to blockchain in healthcare?

ONC should support, track and highlight demonstration projects for the application of blockchain platforms to encourage private sector innovation and inform future policy.



Blockchain

Demonstrations



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