Blockchain in Healthcare
Is it hype, or is it real?

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Blockchain in Health may be overhyped but it is real and has real value when properly applied to real healthcare and life sciences scenarios that truly help drive Triple Aim/Quadruple Aim objectives.

We'll present an overview of Blockchain, the challenges of the traditional Blockchain capabilities, and propose a solution to overcome those challenges – including scalability, security, and privacy.

We’ll present a "Blockchain in Health" decision matrix developed by Microsoft and Intel and leverage research from third-party analysts to discuss the top blockchain in health scenarios and their potential to increase the effectiveness of healthcare processes and solutions while reducing costs by up to 30%.
Blockchain in Health – Is it Hype or Real?

Blockchain technology ... "positioned to be the next dramatic innovation in health care..." – HealthPlan CEO

Will GDPR and blockchain live up to their hype in 2018?

Blockchain is this year's buzzword – but can it outlive the hype?

The open-source ledger behind bitcoin is touted as revolutionary for everything from banking to health, but the jury is still out.

The Guardian, 2018

Don't Let Blockchain Cost Savings Hype Fool You

Blockchain technologies are extremely hyped, evolving at different trajectories, but should not be ignored. – Gartner, 2017 Blockchain Hype Cycle

NIST Report on Blockchain Technology Aims to Go Beyond the Hype

New publication strives to help businesses make good decisions about when and if to use blockchain.

January 24, 2018
Healthcare and Blockchain – It’s Real

Healthcare Payers & Providers Agree on Most Plans for Deploying Blockchain in 2018

- Finances/Reimbursement: 90% (Payers), 82% (Providers)
- Contracting: 93% (Payers), 85% (Providers)
- Supply Chain: 43% (Payers), 53% (Providers)
- Healthcare Internet of Things: 19% (Payers), 73% (Providers)
- Identity Management: 68% (Payers), 59% (Providers)
- Big Data Collection: 83% (Payers), 78% (Providers)

Source: “11 Blockchain Companies shaking up the Healthcare Provider & Payer Industries”, Published October 2017, © Black Book Market Research
Improving & Managing Provider Data

April 6, 2018 - Humana, UnitedHealthcare, Quest Diagnostics, Optum and MultiPlan (5 healthcare firms operating across the U.S. insurance landscape) said they’re launching a pilot program that will help boost the management of healthcare provider data.

Under the terms of the pilot, blockchain will be used with the hopes of improving data quality while reducing administrative costs focused on healthcare provider demographic data.

$2.1 Billion – Estimated cost to maintain provider directories
We’ve seen this pattern in scenarios across industries:

**Manufacturing**
- Asset tracking
- Real-time auction for supplier contracts
- Supply chain transparency
- Dynamic commodities pricing

**Retail**
- Loyalty tracking
- Product provenance
- Logistics management
- Digital rewards
- P2P selling
- Ticket purchases

**Insurance**
- Claims management
- MBS/Property payments
- Fraud detection
- Automated underwriting

**Banking and Capital Markets**
- Audit compliance
- Bond issuance
- Trade finance
- Loan syndication
- Post trade settlement
- Global payments
- Derivatives trading
- KYC/AML

**Government**
- Licensing and ID
- Land registry
- Benefits distribution
- Aid tracking
- Military security
- Voting
- Copyrights
- Justice system administration

**Health**
- Personalized medicine
- Records sharing
- Compliance
- Pharmaceutical provenance

Additional use cases include:
- Cross-organizational workflow
- Multiparty auditing
What is blockchain?

Or “distributed ledger technology”?
Decentralizes Data in a “Trustless” Environment

- Traditional ledgers are centralized and use 3rd parties to approve and record transactions
- Blockchain safely distributes ledgers across the entire network and does not require a middleman
- The technology maintains multiple replicas
Blockchain*: Analyst Definition & Core Properties

Blockchain is a type of distributed/decentralized ledger/database used to record digital transactions.

- **Decentralized**: Network of replicated databases, synchronized through the Internet and visible to users/miners within the network.
- **Peer-to-Peer Network**: Transactions that satisfy certain conditions are recorded, eliminating a central administrator or third-party intermediaries.
- **Crypto-graphically Secured**: Transactions added to the blockchain are irrevocable or immutable.
- **Trusted**: Network requires consensus, which allows for transactions to occur between unknown parties.
- **Automated**: Avoids double counting and allows transactions to occur automatically.

*Blockchain conceptualized by Satoshi Nakamoto, 2008.
Healthcare Blockchain Scenario Cycle Matrix

Ensure Blockchain scenario addresses FITS model and Quadruple Aim Objectives

Questions to ask:
(1) Does it FIT(S)?
(2) Does it drive measurable Quadruple Aim outcomes?

(1) Dr. Adrian McCullagh: FITS - assess Blockchain benefits: Fraud, Intermediary, Throughput(transaction/sec) and Stable data
(2) Blockchain Cost Savings Potential across Business Functions – 5% to 30% (Frost & Sullivan)
Healthcare Blockchain – Potential Cost Savings

Blockchain promises to unlock new economic advantages by replacing asset management gatekeepers and automating transactional services

- Sales & Marketing – 20% to 30%
- Operations and Supply Chain – 20% to 25%
- IT – 15% to 20%
- Portfolio Management – 15% to 20%
- Finance – 10% to 15%
- Risk Management – 5% to 7%
- Overheads – 5% to 10%

(1) Blockchain Cost Savings Potential across Business Functions – 5% to 30% (Frost & Sullivan)
Blockchain | Network Types

**Public**
- Many, unknown participants
- Writes by all participants
- Reads by all participants
- Consensus by Proof of Work

**Private**
- Known participants from one organization
- Write permissions centralized
- Reads may be public or restricted
- Multiple algorithms for consensus

**Consortium**
- Known participants from multiple organizations
- Writes require consensus of several participants
- Reads may be public or restricted
- Multiple algorithms for consensus

Source: Ethereum blog by Vitalik Buterin [https://blog.ethereum.org/author/vitalik-buterin/](https://blog.ethereum.org/author/vitalik-buterin/)
A Real Solution: Heart minthealth

Leveraging blockchain to transform healthcare and align stakeholders in a new healthcare ecosystem
How Blockchain Enables Patients to PROACTIVELY MANAGE THEIR HEALTH

- Self-sovereign health record and global unique identifier
- Seamless and secure transfer of clinical and behavioral data between patient-authorized stakeholders
- Incentive model through digital tokens that reward positive and proactive behaviors
THE MINTHEALTH™ PLATFORM BREAKS DOWN DATA SILOES

and Empowers Patients

• Secures clinical, behavioral, and medical imaging data in a personal health record protected by blockchain
• Permission for data access granted by patients via smart contracts
• Provides a global HIPAA log for all patient data transactions, in an immutable open-sourced format
• Clinical staff caring for patients will leverage a proven remote care management system*
• Patients can freely share data across stakeholders including doctors, nurses, family members, and caregivers
VIDAMINTS™ ALIGN KEY STAKEHOLDERS
Around the Proactive Patient and Provider

Vidamints will be used for:

- Incentivizing healthy behaviors* and patient-controlled sharing of data for research (academic organizations, pharrm, med device, and life science companies)
- Establishing the patient self-sovereign health identity and record
- Compensating provider success in improving their patient population’s health
- Powering ecosystem redemption including insurance premium reductions, prescription copays, gym memberships, health foods, among other health and wellness brands
Token incentives drive patient and consumer engagement for existing stakeholders

**Patient Care Stakeholders**
- Provider Groups / Health Systems
- Insurance Plans (*Kaiser, Aetna, etc*)
- Self-insured employers
- Chronic Care Management (*MD Revolution*)
- Governments (*Canada, UK, Medicare*)
- Medical Device Industry (*ResMed, Medtronic*)
- Pharmaceutical / Life Science (*Novartis, Amgen*)
- Integrated Delivery Networks (*Kaiser, Geisinger*)
- Accountable Care Organizations (*ACO’s*)

**Consumer Stakeholders**
- Major Brands (*Whole Foods, Amazon, Costco, Walmart* )
- Retail Pharmacies (*CVS, Rite-Aid*)
- Employers

*Kullgren JT – Ann Int Med. 2013*
TOKENIZING PATIENT BEHAVIORS

Vidamint incentives for providers and patients with chronic conditions drive significant ROI for health systems, integrated delivery networks, self-insured employers, and insurance plans.
THE MINTHEALTH™ APPLICATION
Promotes proactive behavior via a self sovereign health record, gamification, social support, and financial incentives*

THE MINTHEALTH™ APPLICATION
Provides a patient centered community* for building support and awareness around managing chronic conditions

*Latkin CA -- Behav Med. 2015
Video: Healthcare Blockchain Solution in Action

https://www.youtube.com/watch?v=-qfwR07cANc
How can blockchain transform healthcare?
Disruption across the healthcare industry

**Health insurance**
Redesign costly legacy workflows, improve liquidity and free up capital. Help reduce infrastructure costs, increase transparency, reduce fraud and improve execution and settlement times.

**Hospital operations management**
Better supply chain management, smart contract platforms, digital currencies, and tighter cybersecurity.

**Healthcare delivery**
Removes third-party verifiers such as health information exchanges by directly linking patient records to clinical and financial stakeholders. Provides fast, secure, authenticated access to personal medical records across healthcare organizations and geographies.

**Government**
Increase transparency and traceability of how money is spent. Track asset registration, such as vehicles. Reduce fraud and operational costs.
Additional Blockchain Resources

- Dev Ops Samples - https://github.com/Azure-Samples/features/blockchain
- Blockchain Basics Video(s) - https://azure.microsoft.com/en-us/resources/videos/blockchain-basics/