

Blockchain for Healthcare Data

Center for Health Data Analytics

Laxminarayana Ganapathi (Gana)

- Blockchain technology's promise to healthcare
- Current Industry status
- Role of the individual and the opportunities
- CMS Data and Blockchain technology
- Cost reduction and other benefits for stake holders

- A solution which whose time has come!
- Features of a transaction using blockchain:
 - Immutable
 - Secure / Encrypted
 - Trust
 - DECENTRALIZATION
- Benefits
 - Reduced cost
 - Improved efficiency
 - New opportunities

Blockchain Basics

- Open Distributed Ledger
 - difficult to change
 - data / pre-hash/ post-hash
 - genesis block
- Persistent Append only Public ledger
 - Trust the mechanism and not the actor
 - New discipline of clients?
 - Electricity as new app?
 - **Makes possible lot of difficult use cases**

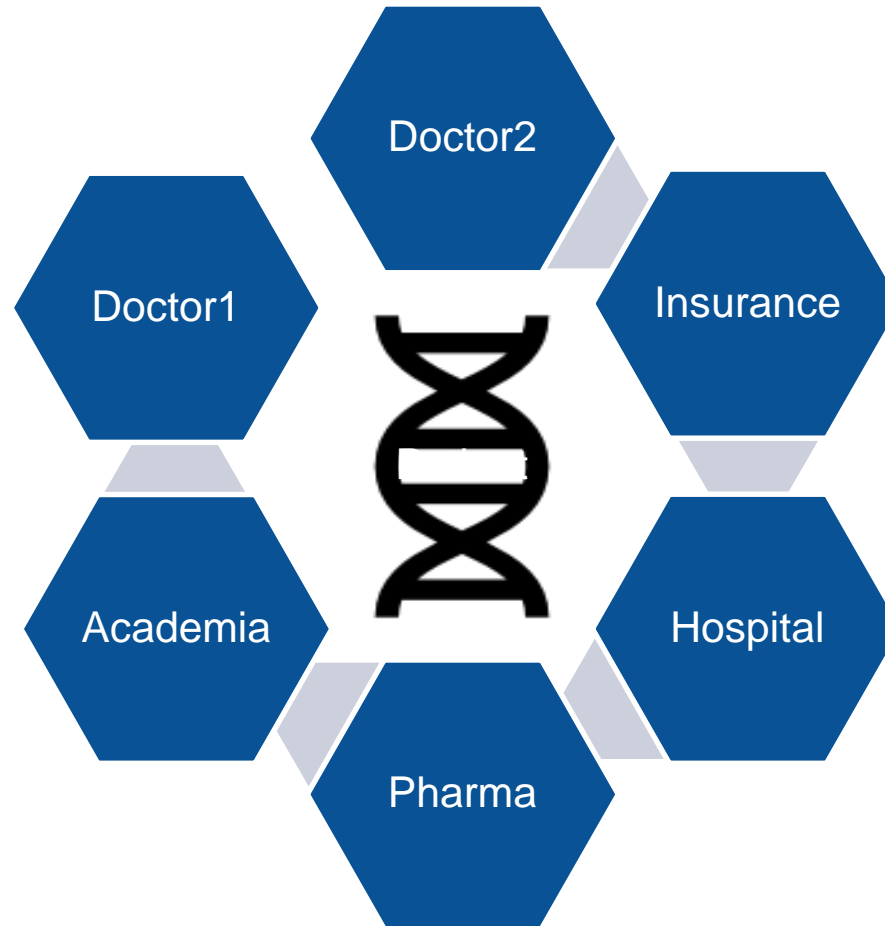
Blockchain & Progress of Internet

- Web 1.0 : Static content
- Web 2.0: Dynamic content and secure transactions
 - e-Commerce
 - Centralized data centers / decision making
- **Web 3.0 (Blockchain)**
 - Decentralization
 - Trust (embedded in the code)
 - Secure and Immutable

Transactions with trust-in-code

- trade at scale
- one-one that can be scaled
- no company in the middle
- peers running same software and authenticating
 - reduce the # of peers ?
- **verify the legitimacy of vendor**
- **identity structure**
 - **government could sign**
 - **university could sign**
 - **DMV could sign**

Patient-Data & Healthcare network



What can go on BC

- Patient data
 - Provide access and control to patient
 - Universally available (only relevant parts – deidentified)
 - Validated up to date patient info
- Transaction / contracts
 - Improve administrative process
 - Reduce cost and revenue cycle
 - Fast efficient payment of claims

EHR/EMR on the Chain?

- Patient Medical Records
 - Access to patients
 - Ability to control access to other parties
 - Doctors / Hospitals / Insurers / Research Organizations
 - Monetize and benefits
- Medical Claims
 - Multiple Immutable authentication b stake holders
 - Reduction in cycle-time
 - Reduction in fraud

- Patients will not be able to alter the chain but own all other rights
- Doctors have rights to correct any mistakes made earlier keeping an audit trail
- All approvals and corrections are documented
- Makes rule based transactions possible with no communication gaps

Challenges

- If decryption key is ever leaked, there is no way to remove the sensitive data itself from the blockchain, even obfuscated data
- Need for decentralized consensus
- Honey-pots in the legacy systems
- Identifying and promoting miners among all the stake holder community

- Heard IPO?
 - ICO = Initial Coin Offering
- PYCO
- MED
- SSOT Apr-15
 - A Smart contract and Blockchain powered health information network (HIN)
 - PCHS
- CLIN - CliniCoin

Healthcare-Coins!

- Medicalchain – MED tokens– based in UK
- Patientory – PYCO – based in USA
- Simply Vital Health – Health Nexus –ERC20
 - Casper
 - Ethereum - fork
 - HIPAA compliant
 - Protocol? / Insurance payments / care coordination
 - Not storing data on the chain
 - Several projects on plate
 - Revenue generating blockchain product

Health coins cntd.....

- EHF
- SRCOIN
- WELL
- Docademic | MTC
- Linnia

Opportunity with Responsibility

- Digital tools let you take the initiative in a variety of ways to become more involved in your own health care:
- Create your personal health record (PHR) and reap the benefits of tracking your own health care
- Monitor the progress of your health
- **Practice good personal health information hygiene to minimize the risk of personal information security breaches**
- **Discuss the use of electronic health records (EHRs) with your doctor, pharmacist, or health insurance company**
- **Stay on top of health IT developments: sign up for news alerts and/or connect with other health IT users to share information and personal health IT experiences.**

Reducing the Tech-Burden on Individual

- Who and how to authenticate the patient?
 - Patient
 - Biometrics
 - Photo ID
 - Password (?)
 - Consortium Agents
 - Insurer authenticates / adds a block
 - Provider authenticates / adds a block
 - Phone calls/ visits / other ideas ?

- 78 % of Physicians and 96% of hospitals possess certified EHR
 - Report to congress in 2016 – No mention of blockchain ?
- **State Health Information Exchange**
- Building the business case for interoperability, particularly through delivery system reform efforts that change the way the Centers for Medicare & Medicare Services (CMS) pay for care to reward quality over quantity of services

- Trust issues / hacks/ Stolen/ID theft
 - Risk with centralized process
 - Easy book-keeping by a consortium
- Multiple stake holders could verify the authenticity of a transaction
 - Insurer
 - CMS/Private
 - Providers
 - Hospitals/doctors
 - Beneficiary / patient - agent

- Structure of CMS Claims- Database
- Can CMS play the consortium – reviewer of chain authentication?
- Burden on Stakeholders
 - Mining – ledger keeping
- Technology awareness needed for patients

What does Medicalchain do?

- A free, password protected electronic health passport, which securely holds all of your healthcare records
- 24/7 access to your healthcare records, via your computer or mobile device
- **Ability to grant any doctor access to your healthcare record at anytime, anywhere in the world**
- Patient friendly information to improve your healthcare literacy and understanding of how best to manage your health and wellbeing
- Access to an ever growing range of personalized health services



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Own Your Health

Be part of Medicalchain's pilots

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In The Press



Patient Interest Form

← → ↻ Secure | https://join.medicalchain.com/patient/ ☆

Phone Number

Address

Search Address

GP Practice

Search Practice Name/Postcode 🔍

Can't find your GP practice? [ENTER IT MANUALLY](#)

I am registered at the above practice as an:

NHS patient

Private patient

By signing up to this form I give express consent for Medicalchain to contact the specified general practitioner on my behalf and to be kept informed as to the status of my registration.

[REGISTER](#)

Opportunity for CMS

- A large base of structured data with good data model
- Deidentified ID that could be linked to cases for research
- Promote research based on the vast data
- Reduced Fraud

Summary

- Blockchain technology has caught the imagination of investing public
- People have started participating in Health-Coin initiatives and the associated blockchain networks
- There is need to streamline the process and educate the public about proper behavior and precautions on these networks
- Structured CMS Data can be made available with HIPAA compliance
- Cost reduction in several domains of healthcare is possible.

Blockchain efforts in News

- EY teams with Microsoft, Maersk to use blockchain for marine insurance
 - Blockchain built on Microsoft Azure
- IBM partners with food giants
 - use blockchain technology to trace the movements of food to avoid / tackle contamination faster.

Off-chain and On-chain Execution

