Code-A-Thon Projects

1st Place

Health Passport

Team Health Wallet, 1st place winners for the Health Wallet Project.

(Photo Courtesy of the Chamber of Digital Commerce)

Emrify Health Passport is a decentralized personal health record that empowers the patient to take control as they navigate health systems to put vital health information in the right hands at the right time. Health information should flow like water across any boundaries. By using blockchain, the patient takes ownership of their health and be the authority of trust between disparate systems. The health passport is crucial in the management of sharing health records among any provider and consortium providers in the world. With the rich data in one place, the health passport offers a beautiful user interface layer to allow patients and providers make the most of health information. With complete control, patients are free to share it during emergency, telemedicine, clinical trials, family members health, and other life-saving research.

Submission: https://github.com/vikas1188/Gov-Hack/tree/master

Presentation: Forthcoming

2nd Place

Nucleus Health

(Team Nucleaus Health, 2nd Place, *Photo Courtesy of the Chamber of Digital Commerce)*

The goal of the Health Genesis project is to show how medical records can be shared using blockchain technology:

- Identity Management is handled via public key cryptography
- Authentication of identities is handled via digital signatures
- Authorization of access to medical records is handled via smart contracts linking identities to URI based resources and verified by a resource servers.

This architecture generalizes identity management so the same model can be used by patients, providers and computer systems. It also generalizes access to URI based resources and can be easily integrated with modern standards such as HL7 FHIR, DICOMweb and future resource based protocols such as IPFS.

Submit: https://github.com/NucleusIo/HealthGenesis

Presentation: ONC Code-A-Thon Nucleus - team slides.pdf

TMI (Trust My Identity)

(*Team TMI, 2nd place, Photo Courtesy of the Chamber of Digital Commerce*)

Trust My Identity (Team TMI) examined the pervasive problem the entire healthcare system faces when conducting in-depth background checks for doctors (or other clinicians) and maintaining current practice information. The information we are talking about includes a doctor's physical location, hours, languages, training, work history, disciplinary history... and more. Centralized provider registries are plagued by issues of accuracy due to process complexity, inconsistent + legacy data structures, and limited information sharing capabilities. We challenged the traditional concept of a directory by using a distributed blockchain architecture. We proved that it is technically possible to create asynchronous and real-time updates as well as attestations by multiple entities. In short, we demonstrated that a distributed directory is not only possible, but also improves data integrity with a blockchain backend. This tool will facilitate the transition to value-based payment models, improvements in care coordination and easier population health analytics. To help make this solution become a reality, we encourage ONC to increase efforts to educate not just healthcare organizations but also the general public on the opportunities and cost-savings offered through blockchain technology.

Submit: https://github.com/Giehlls/DoctorDirectory/tree/ONC-Coda-Thon-Code

Presentation: Codeathon - Trust My Identity.pdf

3rd Place

D3 Health

Remote Participation, No Photo Available

This solution id focused on treating healthcare data as asset with an associated value. The vision for the D3 Health Platform is to create a market for data that enables both the owners/sellers of the data and subscribers/buyers to securely exchange data and associate value to those as assets. Many of the problems that face healthcare today will not be solved by a technology however using technology to enable market forces that drive adoption and incentivize interoperablity will change the landscape of data sharing in healthcare. Because the value of a data asset and ROI for the buyer can be calculated, a market can be created to facilitate the transfer of data assets and monetize data at a level granularity that is currently not feasible. During the code-a-thon we were able to create a prototype that demonstrated how this transfer could utilize Blockchain technologies to enable this new Data Asset Exchange Platform.

Submission: https://github.com/dukoolio/d3health_code

Presentation: d3.pptx

MC/DC

(Team MC/DC, 3rd place, Photo Courtesy of the Chamber of Digital Commerce)

The MC/DC infrastructure leverages the ZCash blockchain to ensure medical record request metadata is private and secured. Provider to Provider as well as Patient-mediated exchange is authorized using the MC/DC PolicyService which receives and returns authorization requests through the ZCash blockchain transactions. Only authorized parties (i.e. the Patient and the Provider requesting authorization) can audit their relevant transactions.

We elected to use ZCash protocols because of unique features that provide anonymity for patients and providers as well as strong encryption for request metadata. Simulating these benefits on other blockchains would require complex smart contracts. While we do not store any patient data on any components of our system, the ZCash blockchain does securely maintain auditing information for requests and authorizations relating to sharing PHI.

Submission: https://github.com/Prestructure/DCBlockchainHackathon

Presentation: Forthcoming

Mesh Health
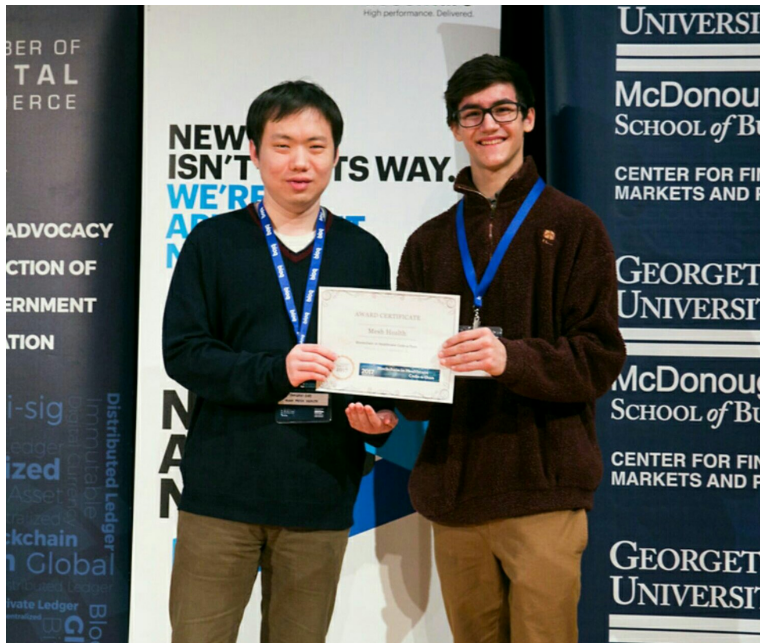
(Team Mesh Health 3rd place, Photo Courtesy of the Chamber of Digital Commerce)

Mesh Health demonstrated the use of blockchain technology as decentralized public key infrastructure to establish an interoperable, universal healthcare identifier for healthcare network participants.

Submission: https://github.com/venkatAnne/MedTechMD-Chain

Presentation: Forthcoming

Honorable Mentions

2c Data			Team Divvy

TaLIa (Trust Layer Injection), is a framework to use blockchain for security metadata and tagging to manage access, provide auditing and provenance information while integrating into an existing HealthIT solution. Our system involves the use of a public blockchain as an access-control manager to health records that are stored off blockchain in a Hadoop data lake. We targeted a "least new solution" approach to reduce the impact to the existing IT enterprise and mitigate Innovation Risk. All of the technology had to be open source and Apache based.

We started with a modern, but fairly well-known, data lake architecture; Apache Hadoop and Hbase. For the blockchain, we used IBM's Hyperledger Fabric, an Apache-licensed open source framework.

Submission: https://github.com/2cData/DCBlockchainHackathon

Presentation: Talia.pdf

MedTechMD-Chain

MedChain addresses track 2: Metadata Tagging and Policy Expression: Demonstrate the use of blockchain for security metadata and tagging to manage access, provide auditing and provenance information.

By doing the above the following is being demonstrated:

Patient Physician Network

Healable is a mobile app that helps physicians consult with patients using secure video chat that is HIPAA compliant and takes care of billing and payments. It also helps physicians connect, collaborate, and consult with other physicians worldwide using secure data sharing while keeping patients ID protected.

For patients, it lets them connect with other patients with similar conditions, get self-help information and help each other while keeping their identities private.

Use of BlockChain

In the prototype built during the Code-A-Thon, we used a test Blockchain platform named Jingtum system (http://www.jingtum.com/) to demonstrate the following steps:

Patient functions:

a) Registration: Patient information can be verified by the App and approved by sending the account digital currency for activation.

b) Information sharing: Patient can use his account to release his information in IPFS for the Physician (not implemented in the prototype).

c) Payment: Patient can use his account to pay Physician fees (not implemented in the prototype).

Physician functions:

a) Registration: Physician information can be verified by the App and approved by sending account digital currency for activation.

Opioid addiction affects about 2.2 million Americans. Opioids are often first prescribed as pain medication for legitimate causes. However, addiction to prescription opioids poses serious problems and may ultimately lead to death. About $75 billion per year in productivity is lost due to opioid addiction. Doctors have found that patients wanting a prescription for opioid based medications find several ways to obtain them. Many states have taken measures for prescription monitoring and although useful, these measures are limited in scope and impact. Patients who are desperate for prescription drugs, for example, may be willing to cross state lines to obtain them. We propose creating a Blockchain based on a program that accounts for opioid dispensing within and outside of states. Our program follows opioid medications from the time they are manufactured to the time they are dispensed. This type of monitoring helps control and maintain accountability of these medications. In addition, the program will help identify those who are at risk of developing an opioid addiction with the intention of linking them to proper service providers and interventions.

Submission: https://github.com/euphonic/divvyblockchain

Presentation: Team Divvy_Healthcare Hackathon_v2.pptx

1. The storage of metadata (ownership, access rights, security credentials) for medical records 2. Validation is happening via the metadata at the time of access - grants 3. For audit purpose there is clear trail of when all the particular report was accessed and who all asked for it 4. For provenance, the origination of the report (lab and prescribing physician is tagged to the metadata) Submission: https://github.com/venkatAnne/MedTechMD-Chain Presentation: None provided.	b) Information sharing: Physician can use his account to receive patient's information in IPFS (not implemented in the prototype). c) Payment: Physician can use his account to receive payment from the Patients and pay other Physician fees (not implemented in the prototype). Submission: https://github.com/mdranger/Code-A-Thon.git Presentation:PatientPhysicianNetworks_20170321.pptx PatientPhysNetworksProject Synopsis.docx