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ONC announces Blockchain challenge winners

Papers suggest new uses for Blockchain to protect and exchange electronic health information

The Department of Health and Human Services' Office of the National Coordinator for Health Information Technology (ONC) today announced the winners of the *Use of Blockchain in Health IT and Health-related Research Challenge*. A Blockchain—most commonly associated with digital currency—is a data structure that can be timed-stamped and signed using a private key to prevent tampering. ONC received more than 70 submissions from a wide range of individuals, organizations and companies addressing ways that Blockchain technology might be used in health and health IT to protect, manage, and exchange electronic health information.

"We are thrilled by the incredible amount of interest in this challenge," said Vindell Washington, M.D., M.H.C.M., national coordinator for health IT. "While many know about Blockchain technology's uses for digital currency purposes, the challenge submissions show its exciting potential for new, innovative uses in health care."

ONC selected the winning papers based on several factors, including the papers' proposed solutions or recommendations for market viability; creativity; ability to inform and foster transformative change; and potential to support a number of national health and health information objectives, including advancing the flow of health information for where and when it is needed most.

The final winners are:

1. **Blockchain and Health IT: Algorithms, Privacy, and Data [PDF – 507 KB]** - PDF**.** A peer-to-peer network that enables parties to jointly store and analyze data with complete privacy that could empower precision medicine clinical trials and research.

Authors: Ackerman Shrier A, Chang A, Diakun-thibalt N, Forni L, Landa F, Mayo J, van Riezen R, Hardjono, T.
Organization: Project PharmOrchard of MIT's Experimental Learning "MIT FinTech: Future Commerce."

2. **Blockchain: Securing a New Health Interoperability Experience [PDF – 609 KB]** - PDF**.** Blockchain technologies solutions can support many existing health care business processes, improve data integrity and enable at-scale interoperability for information exchange, patient tracking, identity assurance, and validation.
   Authors: Brodersen C, Kalis B, Mitchell E, Pupo E, Triscott A.
   Organization: Accenture LLP

3. **Blockchain Technologies: A Whitepaper Discussing how Claims Process can be Improved [PDF – 1 MB]** - PDF**.** Smart contracts, Blockchain, and other technologies can be combined into a platform that enables drastic improvements to the claims process and improves the health care experience for all stakeholders.
   Author: Culver K.
   Organization: Unaffiliated

4. **Blockchain: Opportunities for Health Care [PDF – 787 KB]** - PDF**.** Presentation of an implementation framework and business case for using Blockchain as part of health information exchange to satisfy national health care objectives.
   Authors: Krawiec RJ, Barr D, Killmeyer K, Filipova M, Nesbit A, Israel A, Quarre F, Fedosva K, Tsai L.
   Organization: Deloitte Consulting LLP

5. **A Case Study for Blockchain in Healthcare: "MedRec" Prototype for Electronic Health Records and Medical Research Data [PDF - 591 KB].** - PDF A decentralized record management system to handle electronic health records, using Blockchain technology that manages authentication, confidentiality, accountability and data sharing.
   Authors: Ekblaw A, Azaria A, Halamka J, Lippman A.
   Organizations: MIT Media Lab, Beth Israel Deaconess Medical Center

6. **The Use of a Blockchain to Foster the Development of Patient-Reported Outcome Measures [PDF – 195 KB]** - PDF**.** Use of the Internet of Things in combination with Blockchain technology for Patient Reported Outcome Measures (PROMs).
   Author: Goldwater JC.
   Organization: National Quality Forum

7. **Powering the Physician Patient Relationship with 'HIE of One' Blockchain Health IT [PDF-162 KB]** - PDF**.** 'HIE of One' links patient protected health information (PHI) to Blockchain identities and Blockchain identities to verified credential provider institutions to lower transaction costs and improves security for all participants.
   Author: Gropper A.
   Organization: Unaffiliated

8. **Blockchain: The Chain of Trust and its Potential to Transform Healthcare – Our Point of View [PDF- 249 KB]** - PDF**.** Potential uses of Blockchain technology in health care including a detailed look at health care pre-authorization payment infrastructure, counterfeit drug prevention and detection and clinical trial results use cases.
   Organization: IBM Global Business Service Public Sector

9. **Moving Toward a Blockchain-based Method for the Secure Storage of Patient Records [PDF – 270 KB]** - PDF**.** Use of Blockchain as a novel approach to secure health data storage, implementation obstacles, and a plan for transitioning incrementally from current technology to a Blockchain solution.
   Author: Ivan D.
   Organization: Unaffiliated

0. **ModelChain: Decentralized Privacy-Preserving Health Care Predictive Modeling Framework on Private Blockchain Networks [PDF – 272 KB]** - PDF**.** ModelChain is a framework used to adapt Blockchain to enable privacy-preserving health care predictive modeling and to increase interoperability between institutions.
   Authors: Kuo T, Hsu C, Ohno-Machado L.
   Organizations: Health System Department of Biomedical Informatics, University of California San Diego, La Jolla, CA Division of Health Services Research & Development, VA San Diego Healthcare System.

1. **Blockchain for Health Data and Its Potential Use in Health IT and Health Care Related Research [PDF – 1.5 MB]** - PDF**.** A look at Blockchain based access-control manager to health records that advances the industry interoperability challenges expressed in ONC's *Shared Nationwide Interoperability Roadmap*.
   Authors: Linn L, Koo M.
   Organization: Unaffiliated

2. **A Blockchain-Based Approach to Health Information Exchange Networks [PDF-402 KB]** - PDF**.** A Blockchain-based approach to sharing patient data that trades a single centralized source of trust in favor of network consensus, and predicates consensus on proof of structural and semantic interoperability*.*
   Authors: Peterson K, Deedvanu R, Kanjamala P, Boles K.
   Organization: Mayo Clinic

3. **Adoption of Blockchain to enable the Scalability and Adoption of Accountable Care [PDF-500 KB]** - PDF**.** A new digital health care delivery model that uses Blockchain as a foundation to enable peer-to-peer authorization and authentication.
   Author: Prakash R**.**
   Organization: Unaffiliated

4. **A Blockchain Profile for Medicaid Applicants and Recipients [PDF – 190 KB]** - PDF**.** A solution to the problem churning in the Medicaid program that illustrates how health IT and health research could leverage Blockchain-based innovations and emerging artificial intelligence systems to develop new models of health care delivery.
   Authors: Vian K, Voto A, Haynes-Sanstead K.
   Organization: Blockchain Futures Lab - Institute for the Future

5. **Blockchain & Alternate Payment Models [PDF - 601KB]** - PDF**.** Blockchain technology has the potential to assist organizations using alternative payment models in developing IT platforms that would help link quality and value.
   Author: Yip K.
   Organization: Unaffiliated

The remaining submissions will be posted on HealthIT.gov on the first day of National Health IT Week, September 26, 2016, in conjunction with the two-day "Use of Blockchain for Healthcare and Research" workshop co-hosted by ONC and the National Institute of Standards and Technology.

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