Future of Blockchain Technology in Connected Health Ecosystem

Convergence of Blockchain with AI and IoMT set to re-architect Healthcare sector

Sept 19, 2017
Revenue growth is the No. 1 growth objective.

More than half of the survey respondents perceive their product/service innovation strategies to be misaligned with evolving customer expectations.

Over 1 in 2 respondents cite an intensifying restrictive regulatory environment as the biggest external threat to growth.

Digital transformation is spotlighted as a powerful source of future innovation and growth.

Personalization and customization is recognized as the new business model most likely to disrupt organizations.

Source: Frost & Sullivan
Leading healthcare companies are investing in tech-enabled solutions with the end goal of “Digital Transformation”.

Source: Frost & Sullivan
Is Blockchain the missing puzzle for healthcare industry digital transformation journey? - A 300 Foot View

Blockchain technology potential applications across six pressing needs of Healthcare industry

- Health Data Interoperability
- Healthcare Business Models
- Cybersecurity
- Precision Medicine Practice
- Value-based Care
- Healthcare Consumerism

Source: Frost & Sullivan
Blockchain Convergence Potential with Emerging Technologies (AI and IoMT)

Building the M2M Economy
- Advanced Biometrics Authentication
- Autonomous device coordination
- Distributed Ledger of Things
- Internet of Medical Things
- Peer-to-peer messaging
- Distributed file sharing

ICT Infrastructure
Building blocks for Decentralized Computing

The Internet of Things

ICT

Cloud Computing

Virtual and Augmented Reality

Artificial Intelligence/Machine Learning

3D Printing

Sensors & Control

Robotics and Process Automation

Smart Tracking & Asset Management

Digital & Autonomous Workflows

Distribution Design Network

Web 3.0 Data & Asset Management Layer

Data Ownership & Value Exchange
- Cognitive Contracts
- Machine Learning-as-a-Service
- Blockchain-based AI Application
- Big Data and Predictive Analytics

Designing a Virtual Open Economy

Source: Outlier Ventures; Frost & Sullivan

Key: ICT—Information Communication Technologies
How will Precision Medicine be Implemented?

Data Sources (%) by Factors to Practice Precision Medicine

Advisory Support
Chronic Disease
Remote Care Data
Sensors / Wearables

Consultation
Imaging / Monitoring
Clinical Data
Screening
Patient History

Environmental
Exogenous Factors
Personal
Lifestyle

Omics/Dx
Omics
Microbiome
Imaging
Others

20%
35%
30%
15%

Blockchain in Precision Medicine? – A 30 Foot View

Patient Generated Data

Off-chain storage

Data Lakes

Health Analytics & IoMT

Providers

Payers

Clinic Data and Health Records

Source: www.healthit.gov; Frost & Sullivan
Blockchain in Healthcare? - Differentiating the Hype from Reality!

Blockchain Adoption Timeline by Major Healthcare Application/Use Case, Global, 2016, 2018, 2021, and 2025

- National Medical/Health Records
- Claims Adjudication, RCM & Billing Management
- Drug Supply Chain & Smart Contracts
- Digital Identity Verification/Management
- Health Token (HSN, Research, Wellness Incentives)
- IoMT (Medical Device and Patient-generated Data Exchange)
- Clinical Trials Records & eConsenting
- Regulatory Audit Trails & Adverse Event Safety Monitoring
- Universal Health Records and Identities

Note: Blockchain systems adoption across these healthcare use cases demonstrate more convincing opportunities, albeit at varying degrees of adoption, across countries and health systems.

Source: Frost & Sullivan
Blockchain Implementation Challenges in Healthcare

Blockchain systems could be expensive and difficult to manage the network consensus; the industry needs to find a deployment trade-off across potential healthcare use cases.

- Conflicting interest among incumbents health data players (e.g. EHR/HIE)
- Standardization and terminology issues with already disparate terminologies
- Finding the scalability trade-off between require computing energy and network types
- Threat of substitute from emerging DLTs (e.g. IOTA Foundation; Graph DB technology)
- Integration concerns: Technical, operational, governance, and economic challenges
- Negative news: Recent security breaches involving bitcoin as ransom money

Source: Frost & Sullivan