

PP28 Future of Pharma through the lens of Blockchain and AI technology

Imran Rashid, Janssen Research & Development

Abstract

Blockchain and AI are two key technologies which can solve century-old problems of trust, traceability, auditability and automation. Which will ignite innovative change in the pharma landscape. This poster is aimed towards providing a quick knowledge base of both technologies and impacts on the drug development process. Along with details towards how one will prove to be the stepping stone for the other.

Present Challenges

- Slow enrollment
- Data integrity
- Audit trail overhead
- Process overhead
- Centralized data
- Data validity
- Reproducibility
- Traceability

Goal

To have **better quality**, **faster**, and **cost effective** clinical trials. In pursuit to bringing best drugs to market and to make them accessible to all patients

Future State

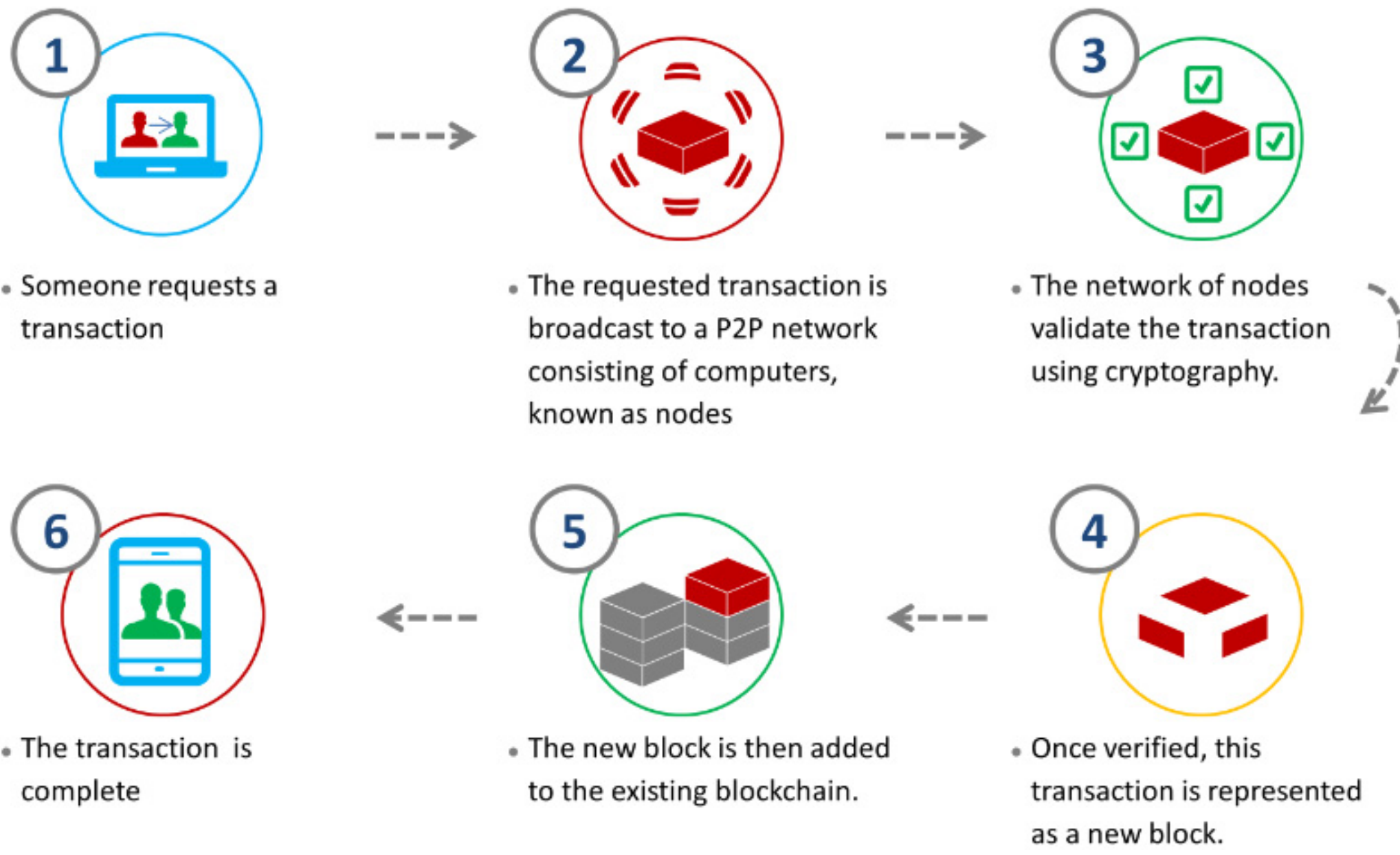
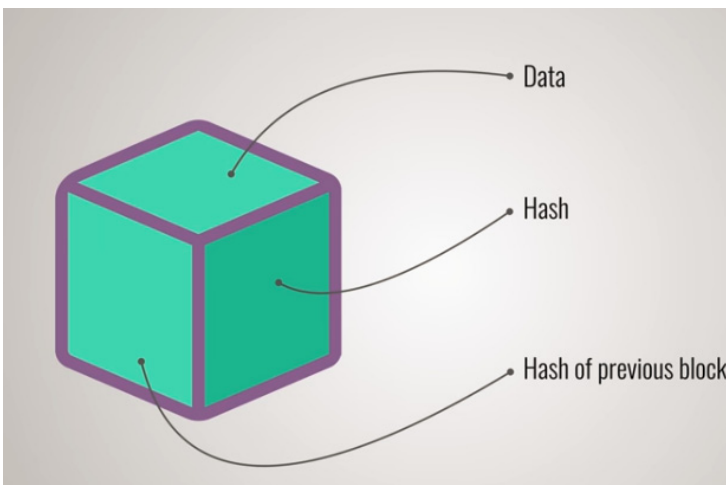
- Patient Centric
- Virtual Sites
- Telemedicine
- IOT
- Remote Trials
- eConsent
- Digital health
- EHR & AI

What is Blockchain?

- A **blockchain** is a decentralized, distributed and public digital ledger that is used to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the collusion of the network
- By keeping an audit trail of all transactions on an unalterable distributed ledger, blockchain technology establishes accountability and transparency in the data exchange process.

Blockchain Overview

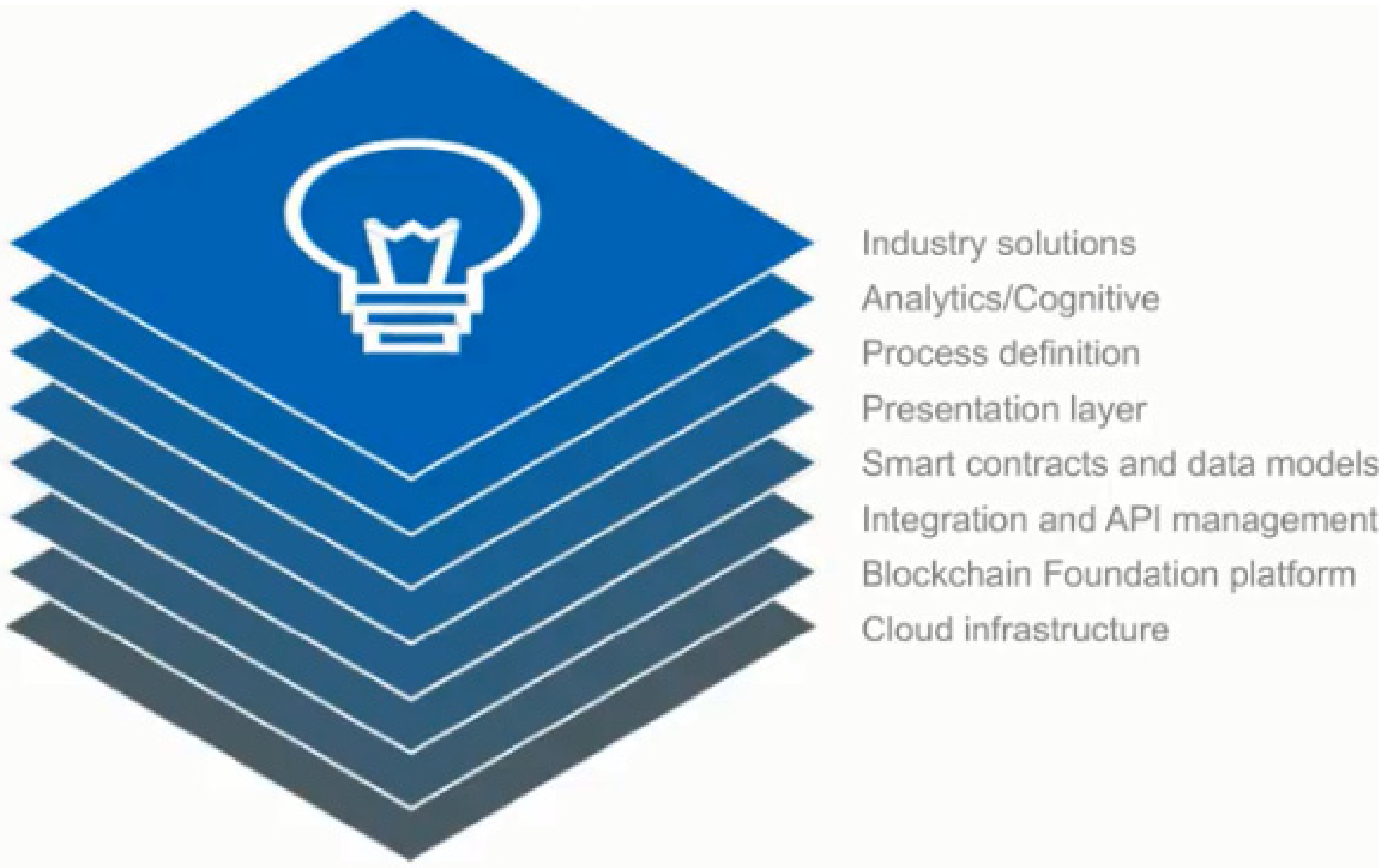
Distributed Ledger	Lower costs	Smart Contracts
Transparency	Auditability	Automation
Security (encryption through cryptography)	Speed	Permanence



Types of Blockchain Implementations

	Bitcoin	Ethereum	Hyperledger
Cryptocurrency required	bitcoin	ether, user-created cryptocurrencies	none
Network	public	public or permissioned	permissioned
Transactions	anonymous	anonymous or private	public or confidential
Consensus	proof of work	proof of work	PBFT
Smart contracts (business logic)	none	yes (Solidity, Serpent, LLL)	yes (chaincode)
Language	C++	Golang, C++, Python	Golang, Java

Blockchain Infrastructure



Why Blockchain?

Use Cases of Blockchain

- Optimizing the patient recruitment/engagement/informed consent process
- Payments and claims
- Clinical Health Data Exchange and Interoperability
- Drug supply chain Provenance and Traceability
- Rethinking Clinical Trail management
- Closing the disconnect between medical and clinical
- Converting Technical standards into Smart Contracts
- Clinical IOT's Data Validation and Sharing via Blockchain for Research and Patient Engagement
- A patient-data driven blockchain empowering patients to "manage" their health record
- Claims Adjudication and Billing Management
- Pharma Clinical Trials and Population Health Research
- Cyber Security and Healthcare IoT

Results of IBM Survey of 200 Healthcare Executives



Examples of Current Blockchain Implementations

- Estonian Health authority** has implemented a Blockchain solution enabling storage of a million health records
- IBM Watson Health** teaming with **FDA** aimed at exploring the exchange of owner mediated data from several sources, such as Electronic Medical Records, clinical trials, genomic data, and health data from IOT
- FarmaTrust** is developing a platform based on blockchain technology to improve drug supply chain integrity
- Medicalchain** is a decentralized platform that apply blockchain technology to solve the problem of health data exchange.
- Healthureum** develops solution for blockchain and smart contract technology to provide for standardization and scalability, while tackling the inflated costs and misuse of patient data
- Synthium Health** provides a unique networking marketplace that brings together healthcare providers and suppliers for simplified, efficient and cost-effective exchanges that build businesses.

Benefits of Blockchain

Truly Patient Centric

Only technology that can truly answer need of patient centric trials.

Help with Enrollment

By enabling secure, anonymous databases, blockchain could allow trial and patient information to coexist in one network. The result? A way to connect patients directly with trials they're both interested in and qualified for.

eConsent

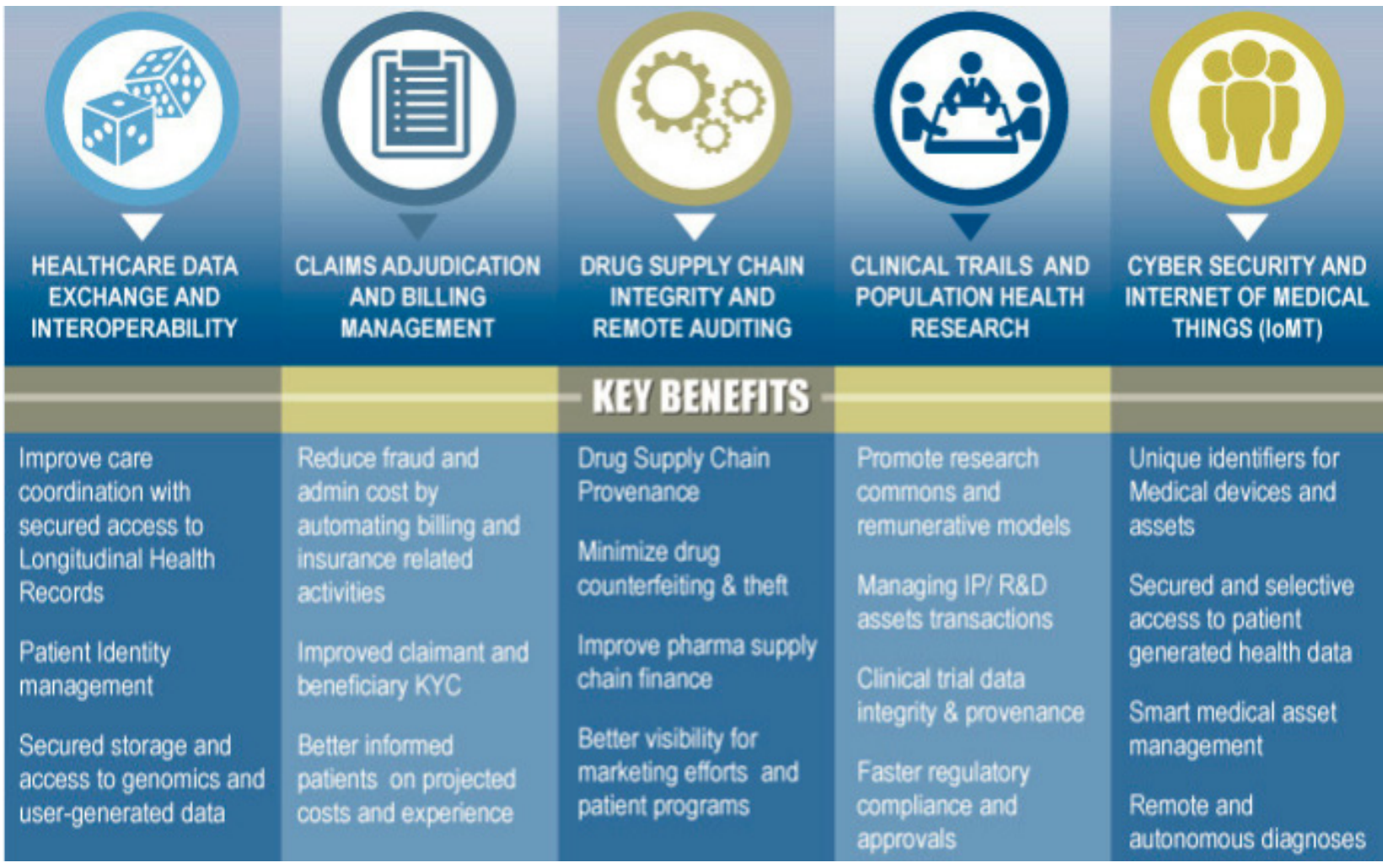
During a trial, blockchain would greatly simplify the process of getting consent from each patient. With blockchain, all consent forms would be time-stamped and stored in a centralized location for easy access and reference.

Data Integrity and Portability

With blockchain technology, timestamped and unchanged results could be fed automatically into a secure tracking system where professionals and participants throughout the healthcare industry could access it

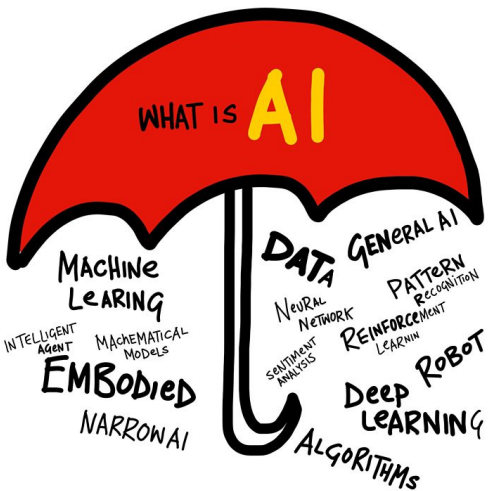
Smart Contracts, compliance, security, and transparency

Help prevent clinical trial events not to happen in the right chronological order: including patients before they consented or analyzing case report forms data before freezing the database.



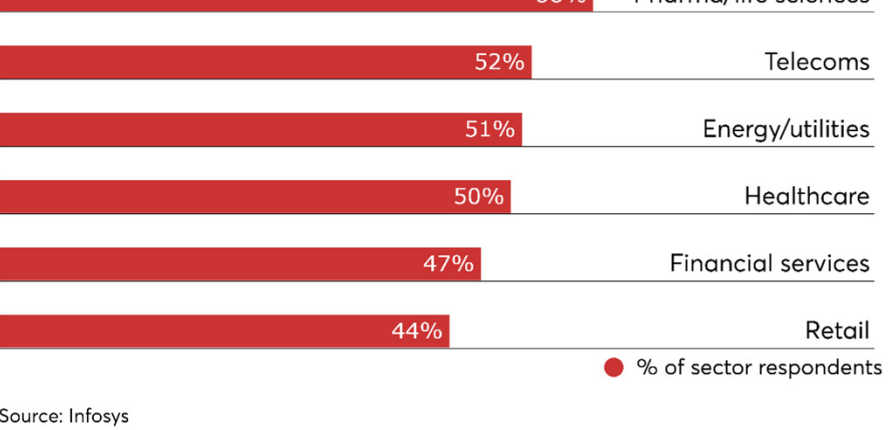
What is AI? How AI and Blockchain transform Pharma?

AI (artificial intelligence) is an umbrella term for the various subsets of technological advancements being recorded in fields which are concerned with machines being able to act more independently and efficiently.

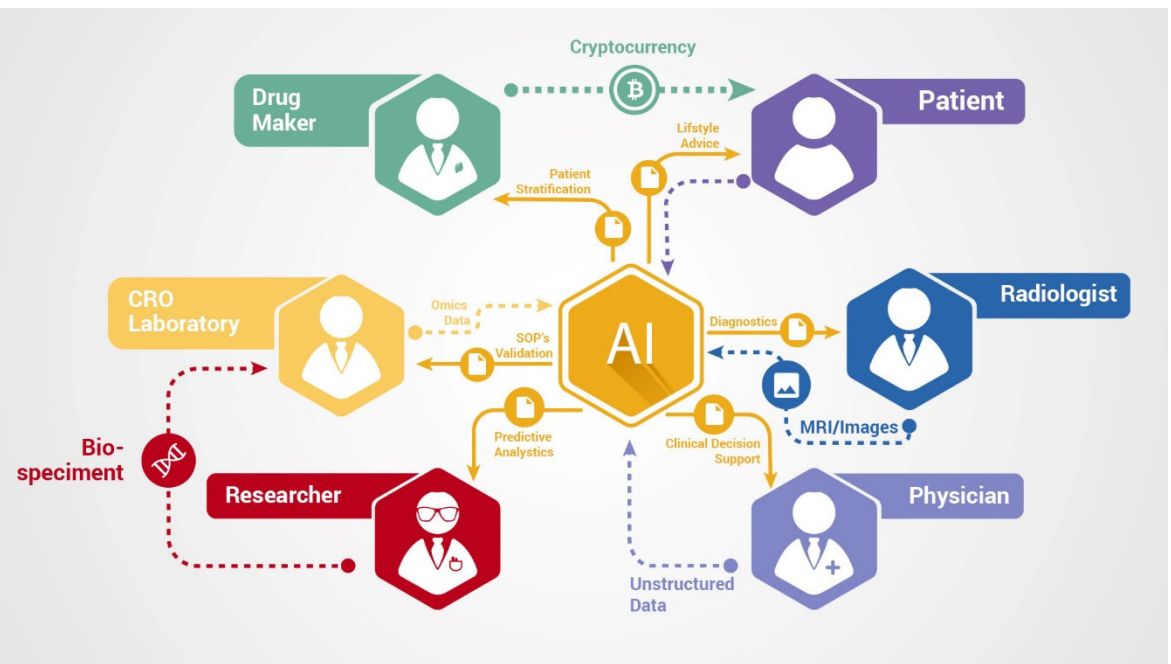


Healthcare joins leaders in AI use

Survey measures scope of adoption across industries



AI-centered blockchain use case



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Contact:

Imran Rashid
Irashid@its.jnj.com
Janssen Research & Development

