



FOSTERING INTEROPERABLE HEALTHCARE ECOSYSTEMS USING BLOCKCHAIN

Abstract

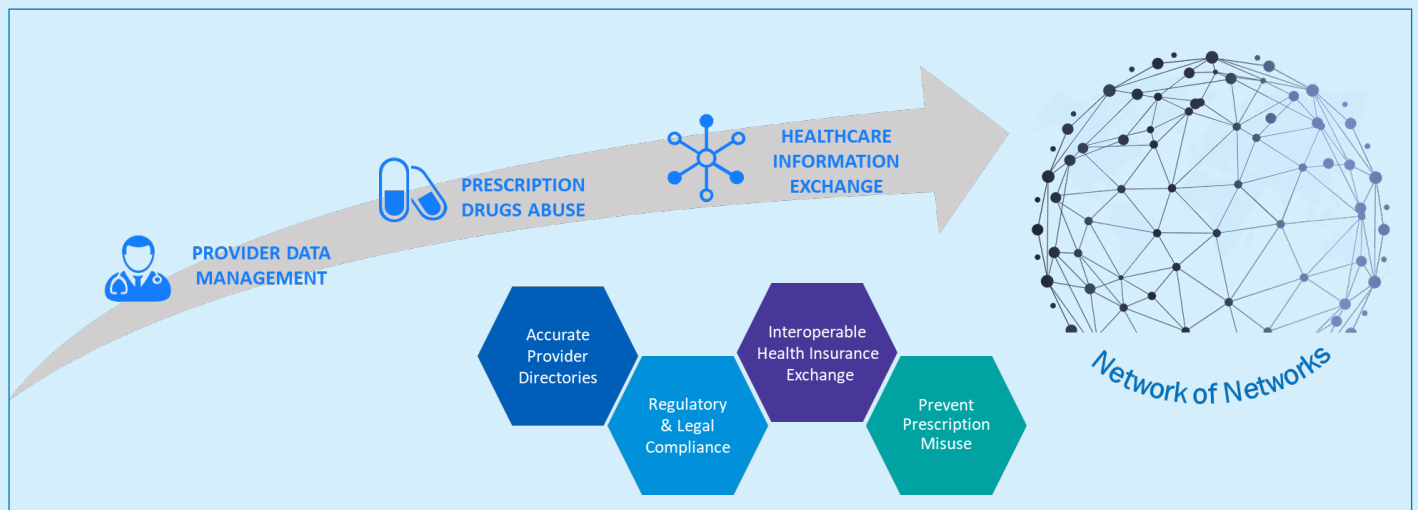
Healthcare is one of the most regulated industries where providers handling electronic protected health information (ePHI) or pharmaceuticals conducting clinical trials for research are subject to extensive regulations. Blockchain in healthcare can help improve regulatory compliance. It is designed to deliver proof of health data and integrity, protect patient data privacy and automate the verification of medication adherence.

Infosys' vision is to create a healthcare network of networks anchored around the creation of strategic healthcare business networks with the launch of three MVP (minimum viable product) blockchain solutions that alleviate the industry pain points – Provider Data Management, Prescription Drug Abuse and Healthcare Information Exchange. Our route is based upon industry priority and speed to market. Our ultimate goal is the realization of a patient centered Healthcare ecosystem, that promises trust, transparency efficiency and data privacy for all parties. This ecosystem is an endeavor to positively impact reconciliation efforts, labor costs, auto-adjudication rates and overall member experience in the healthcare industry.

Blockchain is an open, distributed ledger technology (DLT) that facilitates secure transactions between multiple parties, such as payers and providers. These transactions include, but are not limited to, submitting claims, medical records and payment remittances.

Blockchain has the potential to enable value-based care. At Infosys, we're committed to championing Blockchain innovation that helps our customers and partners realize its potential. We look forward to help clients evolve and establish blockchain as a safe, secure, and transparent way to foster interoperability in healthcare.

Infosys provides value-added services such as network development, system integration, scalable infrastructure, technology support, and regulatory guidance services.



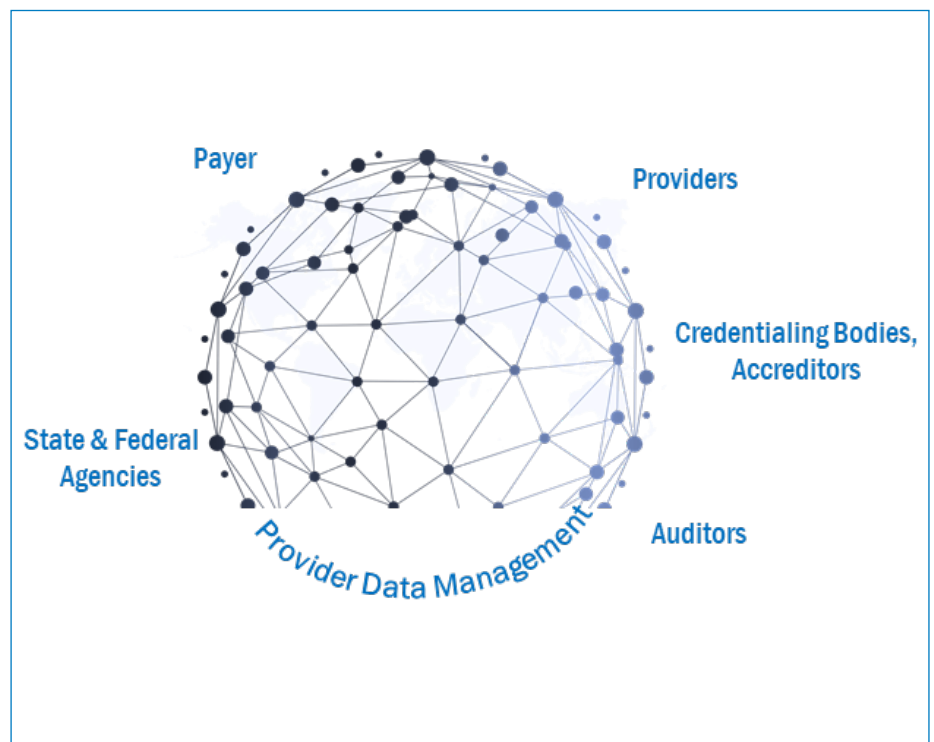
Infosis' vision of a Blockchain Healthcare Network

Provider Data Management (PDM)

The PDM minimum viable business network aims to explore the use of blockchain technology in tackling the challenge of inaccurate provider data and reconciliation overheads across data recorded in disparate systems. A review conducted by the Center for Medicare and Medicaid Services determined that 49% 1 of provider directory locations listed had a least one inaccuracy. The Infosys PDM MVP allows participants to actively publish updates on the platform with the aim of minimizing administrative burdens and inaccuracies, accelerating turnaround and facilitating cost savings for payers.

The intent of the PDM solution on blockchain is to create a Provider Data exchange — a decentralized multi-party ecosystem on DLT, that maintains provider data. This platform is aimed at streamlining administrative inefficiencies, reducing costs, and relieving friction between providers and multiple payers.

Today, managed care organizations, health systems, physicians, diagnostic

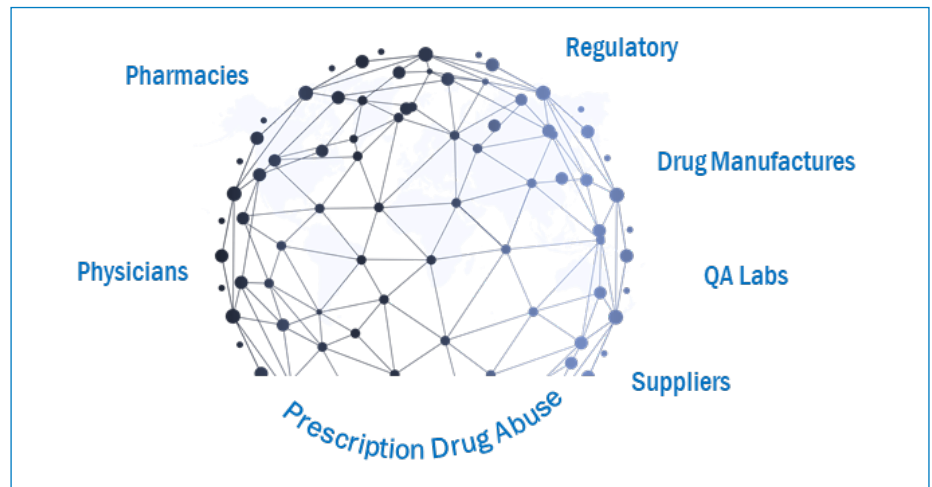


information service providers and other healthcare stakeholders typically collect provider demographic data in separate IT systems maintained by each organization

independently. This promotes vast inefficiencies and duplication of efforts, while also potentially reducing data quality.

Prescription Drug Abuse (PDA)

The PDA minimum viable business network is intended to be an ecosystem for health and pharma regulators to create a robust supply chain for prescription drugs and prevent prescription abuse or misuse by establishing end-to-end traceability of drugs. The blockchain-powered network acts as a single platform to prevent prescription misuse by attributing the liability for abuse to the physician who prescribes the drug or to the pharmacist at the point of fulfillment. Common drug overdose alone is responsible for ~67k deaths over a 12-month period ending Sep'2019 2.. The Infosys PDA MVP is an ecosystem to enable active monitoring and restrictions on the prescriptions issued to a patient by the physician or the drugs dispensed by the pharmacist. Tracking the chain of custody of the drug packages



throughout the supply chain enables an end to end traceability of the drug from production to consumption bringing about complete transparency.

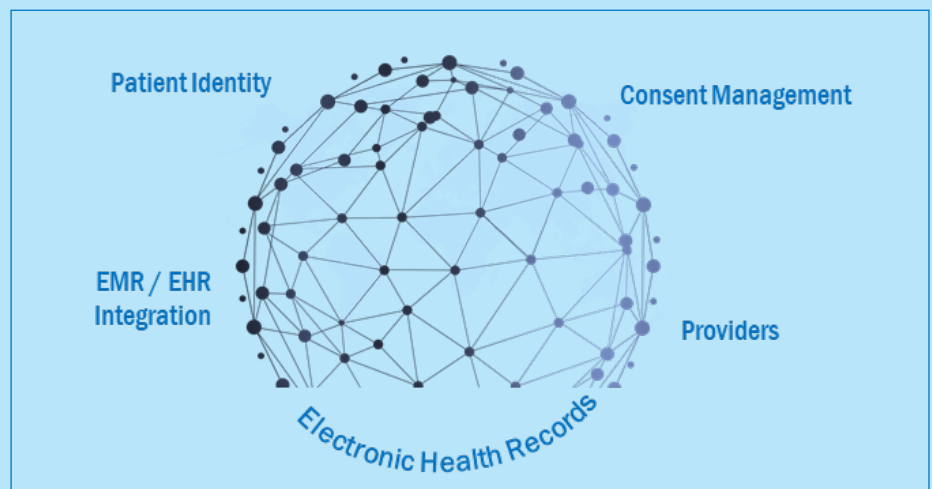
Regulators and health agencies are

tightening regulations around over-the-counter sale of prescription drugs. In the United States the “economic burden” of the prescription opioid abuse is estimated to be around \$78.5 3 billion per annum.

Healthcare Information Exchange (HIE)

The Health Information Exchange aims to provide a seamless ecosystem of Electronic Health Records (EHR) or Electronic Medical Records (EMR) usually managed by healthcare providers. In the current scenario, a patient’s health records are controlled individually by disconnected healthcare providers. Getting a consolidated view of medical history, diagnosis and treatment becomes a challenge. Additionally, there is no assurance of data privacy. Currently, 400,000 4 patients die globally every year due to administrative mistakes in health records.

Challenges exist with large scale health information exchanges because of privacy concerns related to the Personal Health Information (PHI), the security risk associated with a single centralized database, the errors in data exchange because of data mismatch in disjoint systems and a lack of control with the patients. Enabling an efficient Healthcare Information Exchange between the health care providers and diagnostic centers would yield significant benefits for the patient, such as avoiding medication errors,



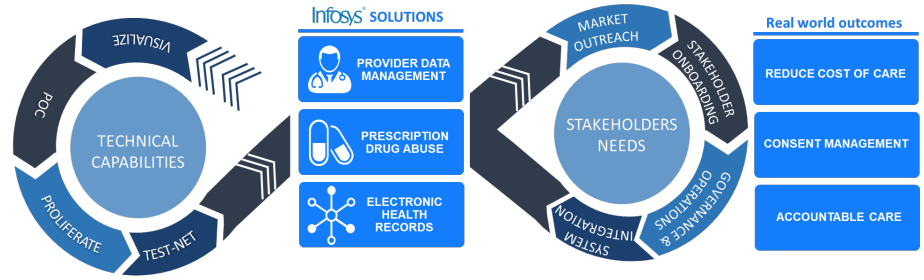
avoiding duplicate testing and improving diagnosis.

The DLT based EHR ecosystem proposes to create a patient centric information exchange. Each healthcare provider servicing a patient will upload episode specific healthcare records into the ecosystem. Any references to prior history will be controlled by the patient. An accurate Healthcare Information Exchange can benefit the patients by significantly reducing the health care costs, minimizing errors because of missing records and better coordination of care

between different specialties with different healthcare providers. The intent of the Healthcare Information Exchange is:

- To build over the initial network of Healthcare providers, diagnostic centers, regulators and Insurance service providers in order to create a seamless Healthcare Information Exchange.
- To enable interoperability between multiple health care providers and diagnostic services without risking the privacy of the patient.
- To help to lower the overall cost of care

Infosys offers strategic advisory, implementation, change management, to operationalization & application maintenance. Infosys has invested in building technical solutions for addressing real world challenges. The stakeholder's needs are mapped to the technical capabilities, accelerated by the Infosys solutions with strong consulting capabilities.



Conclusion

In the initial iteration – the Blockchain ecosystem will focus on bringing efficiencies in existing operations, improving productivity and expense ratios. With a shared ledger and transactions published real time across multiple stakeholders, blockchain can facilitate a seamless transfer of data/value in Provider Data Management and Prescription Drug Abuse. The result will be dramatically increased efficiency, lower costs, faster processing, improved data quality and reduced fraud.

- Health Information Exchanges that should ensure consistency in patient data while securing data privacy, can be made a reality by Blockchain, which will transfer the control and ownership of patients' health information to the patient.

The impact of blockchain will not be confined simply to driving greater efficiency; it has a strong potential to disrupt the healthcare market, driving creation of new business models like research and clinical trials by protecting the health identity of individuals

involved; scale the number of people who can and are willing to contribute to studies like genomics data analytics; create new business models by sensor fusion of medical devices with emerging technologies like Telehealth.

Thus, Blockchain is poised to rewrite the rules of competition in the healthcare industry by streamlining operations, enabling data to be shared seamlessly with external stakeholders and disrupting traditional business models and intermediaries.

About the Authors



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A seasoned IT Leader with rich experience in Technical Consulting and Delivery across technology and industry domains. Rohini has extensive experience in managing large accounts, incubating and developing new practices and sustaining delivery excellence. Her passion for technology coupled with all-round delivery experience is the rigor she brings in driving innovation in her portfolio. As a Practice Manager with the Blockchain Service line, she is responsible for thought leadership, design of disruptive solutions & consulting towards Blockchain led business transformations for clients across industry verticals.



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Divik handles global engagements in Healthcare, Life Sciences, Energy and Utilities in Blockchain. He also offers executive level advise and thought leadership focusing on how blockchain can be applied to specific business units and how to it can leveraged by public or private sector organizations. He also has expertise to undertake assessment of corporate strategy to evaluate blockchain potential applicability and business impact.



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Sanal is responsible for business solution development for Healthcare and Lifesciences engagements in blockchain practice. He has 13+ years of IT and Consulting experience. He works closely with clients and development teams enabling use case enrichment through design thinking workshops, development of blockchain implementations and enterprise application integration.

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