

# Is Blockchain the Next Cure for Life Sciences?

A perspective on how the  
supply chain space is poised  
for major disruption.



# Disruption awaits

We are full throttle into a new era of the digital economy, where concepts like big data and artificial intelligence (AI) are fast becoming the new currency – a currency that will become a competitive advantage lever for the smart and aggressive movers in the months ahead.

Within the life sciences industry, data is the anchor underpinning everything – from product development, and clinical trials to consumer marketing and even logistics. Therefore, the complex and diverse realm of supply chain management is poised to be the next horizon of industry transformation. It's our view that blockchain will become a key enabler for all of this.

Why? The recent acceleration of blockchain beyond the little-understood concept of crypto currency is already launching into the mainstream, with industries as diverse as manufacturing and consumer goods being early adopters of this burgeoning technology. It possesses the potential to radically transform the life science industry's complex supply chain ecosystem and help organizations re-invent mission-critical business process. Read on to see why...

## The innovation landscape around the supply chain

The Food and Drug Administration (FDA) "Drug Supply Chain Security Act of 2013" outlined the building of an electronic, interoperable system to identify and trace prescription drugs. It contained a three-stage guideline to implement the system,

including product verification, serialization, traceability (as depicted in this chart).

**Product verification** – Entails being able to parse data from a storage integrating different software that holds information regarding the 'chain of custody' – containing transaction histories between business partners.

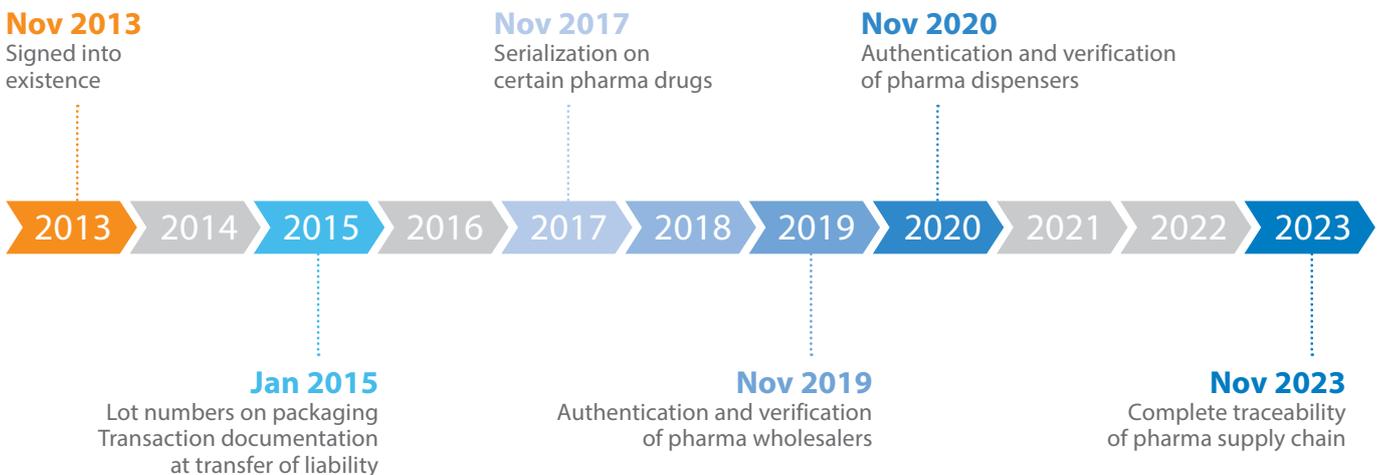
**Serialization** – Defines creating 'start-to-finish' product identifiers to be deployed on all lots and packaging across the globe.

**Traceability** – Outlines the use of an interoperable system downstream in the supply chain, to retailers, pharmacies and hospitals to store unit level data for each transaction.

This ecosystem contains a variety of players, including wholesalers and third-party logistics partners with the storage and distribution networks. It also includes security and legacy data storage system partners ensuring product serialization, traceability and authentication, in addition to cold chain monitoring systems partners. Finally, it entails advanced technology partners that have been making significant headway in modernizing supply chain systems.

For example, Microsoft provides efficient, economically viable and scalable cloud-based systems, with transformed digital landscapes for marketing support on one hand, and maintenance of GMP via digital logbooks – adding trust, data security and audit trails for inspections by regulatory agencies. Others have sought to raise quality and economy of clinical trial processes, boosting patient safety by tracking drugs and tackling counterfeits, creating a compliant audit trail.

### Timeline of the DSCSA Guideline for Implementation



Source: FDA

# The innovation landscape around the Life Sciences Supply Chain



Each of these players brings a wealth of data and capabilities which the industry benefits from. Any such new system must aim to collaboratively integrate these, keeping in mind both the standardization and adherence to regulatory guidelines. The resultant system must also be simple enough to foster easy adoption.

Blockchain might be just be the answer to this because of its inherent features, technological fortitude and a multi-faceted value proposition. Let's explore this idea in more detail.

## Seven game-changing opportunities with blockchain

The logistics and supply chain space today is geographically distributed. Heavy amounts of outsourcing, third-party logistics and complex networks of distribution have enabled a paradigm shift in strategy and scale. There is a need to store large amounts of information, eliminating middlemen and engendering better collaboration and coordination between the parties in a network. Based on key features of blockchain – decentralized, transparent, immutable and secure – several use cases can be envisioned within the broader supply chain space.

**1. Inventory Management** – This is the backbone of the supply chain landscape, as understanding stock levels helps plan orders and manage bullwhip effects. Optimally balancing supply and demand is critical to managing market opportunities and organizational economics as a whole. Blockchain and its underlying features can play a major, enabling role here.

**2. Alerts** – This is especially true during drastic events – force majeure – where alerts to the different nodes of the supply chain become paramount. Epidemics can be another drastic event where public safety and consumer awareness may be enabled for life saving drugs. Blockchain is already starting to play a role

in identifying specific points of contamination for food manufacturers and retailers.

**3. Clinical Trials** – Trial data must be tamper proof and an immutable event log creates much more reliability that a blockchain system might be able to ensure. In addition to this, consent transparency and traceability of administration ensures patient welfare and data integrity.

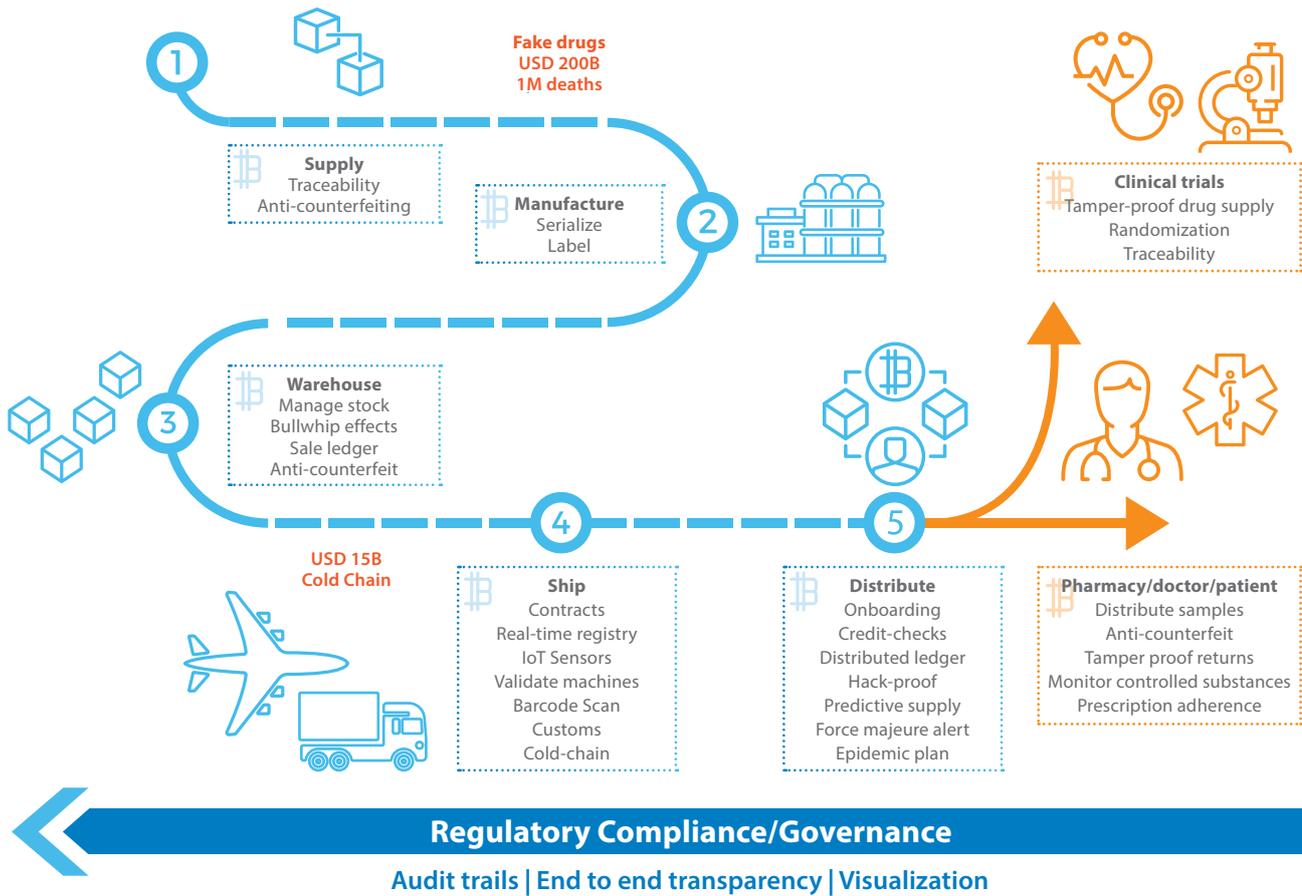
**4. Compliance & Governance** – Blockchain may help create a more transparent and efficient ecosystem for cold chain monitoring via IoT of drugs under transport, and tagging and validation of equipment and other assets around transport and storage. This also provides ease and accessibility with audit trails.

**5. Combating Counterfeits** – Tracking drugs and medical devices have become supremely important, especially in emerging markets where a log of fake products find their way to market. Counteracting this involves tracing each step in manufacturing and distribution and also verifying authenticity of returned products. Blockchain might be key to addressing these issues.

**6. Accessing Credit** – Helping wholesalers access credit via quick credit checks and onboarding is an area blockchain could significantly enhance. Also, general transparency of information and communication across the value chain of manufacturer, distributor, consumer and regulatory agencies could prove beneficial.

**7. Tracking** – Ensuring more precise tracking of highly controlled substances (e.g., opioids) throughout the supply chain is another opportunity that may be capitalized on using blockchain technology. Blockchain could help counteract the opioid issue at the supply chain level – controlling over distribution and enabling physicians to regulate how much of these drugs are offered to patients.

## Blockchain Applications in the Life Sciences Supply Chain



Source: Infosys Consulting

### Still in an early-adoption phase

We are still in a phase of very early adoption of blockchain – one based more on learning, discovery and incubated tests. In the life sciences industry, there's no clear fast movers yet, as the perceived high cost of investment and uncertain returns leave us in an exploratory phase.

Real challenges exist, such as a lack of in-house knowledge and skills needed for implementation. Other questions exist as well. When it comes to solution integration, will different blockchain solutions be compatible? The most efficient way to ensure this is to have a dedicated network and bring together a consortium of companies to agree upon data/governance standards for adoption.

A viable path to adoption and organizational change management will become an imperative consideration once initiatives move beyond concept or prototype.

### A future with promising benefits and business value

Ultimately the benefits and business value of blockchain could be multi-faceted. While reduction in supply chain costs seems an obvious benefit, it happens in tandem with ensuring integrity of product. This can only be realized while being able to provide transparency and ensuring privacy of critical data. Plus, the technology may be used to address a targeted need, transform applications to a modern digital landscape, and establish brand and credibility for a company.

The life sciences industry is at the cusp of a new era of digital transformation. With real solutions already in the market for targeted use cases, blockchain's scalability, practicality and most of all, simplicity, could fast become the next horizon of innovation for organizations large and small.

*Want to learn more? Contact our team of experts and they'll share some of their experiences and client examples to help you plan your journey forward.*

## About the Experts

---



**Dan Albright** – Partner, Leadership Team Member, & Digital Supply Chain Management Practice Head (U.S.)

Dan has 25 years of management consulting experience across the retail, CPG and distribution industries. He currently manages the supply chain group for Infosys Consulting in the U.S., overseeing some of our top clients such as XPO Logistics, TKE, Sprint and Microsoft. He is also a member of the U.S. leadership team and leads a number of corporate initiatives to support our firm's growth strategy. Dan has worked across all components of business and technical transformations during his career. Prior to joining Infosys Consulting, he led the consumer packaged goods, retail, and distribution service practice at Capgemini Consulting. Dan resides with his family in Atlanta, Georgia.



**Aravindh Kamakshinadha** – Consultant, Life Sciences practice (U.S.)

Aravindh is a consultant with the Life Sciences Practice of Infosys Consulting. He advises industry clients on digital transformation projects across the value chain, including R&D and operations. He uses a design thinking based approach, principles of information systems integration and advanced analytics to solve cross-functional challenges around technology adoption, workflow modernization and insights into data. Aravindh holds post-graduate pedigree in operations management, strategy and leadership from the Indian School of Business and a Master's degree in Chemical Engineering from the University of Buffalo.



**Shipra Rastogi** – Senior Principal, Life Sciences practice (India)

Shipra has 17 years of management experience in the pharmaceutical industry and currently serves as a senior principal in the firm's Life Sciences practice. Prior to joining Infosys Consulting, Shipra managed R&D and medical affairs functions across the pharmaceutical industry and was responsible for medical launches of novel therapies in North America. She is an award winning scientist with fellowships from the Susan Komen Breast Cancer Foundation, Canadian Breast Cancer Foundation, and the American Heart Association. Shipra holds a PhD degree in Cancer Biology/Biochemistry and an MBA from the Richard Ivey School of Business, UWO, Canada.

## About Infosys Consulting

Infosys Consulting is a global management consulting firm helping some of the world's most recognizable brands transform and innovate. Our consultants are industry experts that lead complex change agendas driven by disruptive technology. With offices in 20 countries and backed by the power of the global Infosys brand, our teams help the C-suite navigate today's digital landscape to win market share and create shareholder value for lasting competitive advantage. To see our ideas in action, or to join a new type of consulting firm, visit us at [www.InfosysConsultingInsights.com](http://www.InfosysConsultingInsights.com).

---

For more information, contact [consulting@infosys.com](mailto:consulting@infosys.com)

**Infosys**® | **CONSULTING**

© 2019 Infosys Limited, Bengaluru, India. All Rights Reserved. Infosys believes the information in this document is accurate as of its publication date; such information is subject to change without notice. Infosys acknowledges the proprietary rights of other companies to the trademarks, product names and such other intellectual property rights mentioned in this document. Except as expressly permitted, neither this documentation nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, printing, photocopying, recording or otherwise, without the prior permission of Infosys Limited and/ or any named intellectual property rights holders under this document.