

## 5 Transformative Merits of Blockchain in Pharma

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**Blockchain is best known for its role in cryptocurrencies like Bitcoin. The tech's inherent transparency, security and reliability have numerous applications in the pharmaceutical space. Let's look at how this technology can prove crucial to pharmaceutical operations.**



Blockchain - an open, decentralised, secure, public ledger and the technology behind crypto currencies like bitcoin and has caught the fancy of the traditional pharma sector. A number of pharmaceutical companies are exploring its use as a more secure enterprise solution that can solve its major woes-including supply chain disruption, data disparity, stagnation, and poor scientific productivity.

“Blockchain technology has the ability to change the sector significantly. The potential applications of blockchain in pharma are vast, ranging from streamlining existing supply chain procedures to ensuring regulatory compliance to enabling future discoveries. Many of them are already being realised across the industry, and companies are coming up with more and more use cases for the technology,” said Chrissa McFarlane, CEO and Founder, Patientory, Inc, USA.’ Patientory is a global population health management software that gives users access to their health data.

Let's look at how this technology could prove an asset to the pharmaceutical sector.

1. *Securing supplying chains:* The most obvious and widespread application of blockchain in pharma, especially in the wake of COVID-19 the pandemic which has exposed the vulnerabilities in the supply chain. Lack of transparency, difficulty tracking supplies and the shipment of outdated products are among issues that plague the traditional pharmaceutical supply chain. One of the solutions to these issues is the emerging blockchain technology. Blockchain technology has the potential to play a significant role in the supply chain industry, as it can offer a variety of potential solutions to the supply chain issues that the medical industry is now facing. This emerging technology allows for decentralised transaction recording and tracking, as well as increased overall efficiency and the removal of unnecessary intermediaries.

“All supply chain stakeholders will be able to share and update data, ensuring that it is accurate and timely. Pharmaceutical supply chain management could benefit from distributed ledger technology in terms of legislation, logistics, and patient safety as it can be used to trace the origins of medications, the transport of drugs, and the procurement of raw materials,” said Chrissa.

“As a result of malpractice and poorly functioning supply chains, numerous pharmaceutical companies have sought to use blockchain technology to optimise operations and streamline tracing and tracking, medical transactions, and patient safety,” added Chrissa.

The Pharma industry is keen to explore this. The MediLedger Pilot Project, a consortium of leaders from 25 pharmaceutical companies, is building an industry-owned permissioned blockchain network for the pharmaceutical sector based on open standards and specifications.

In 2020, IBM, KPMG LLP, Merck & Co. Inc., and Walmart Inc. successfully completed an USFDA ( United States Food and Drug Administration) pilot program that demonstrated how blockchain technology can be used to help meet the Drug Supply Chain Security Act (DSCSA) requirements to verify, track, and trace prescription medicines and vaccines distributed within the United States.

2. *Counterfeit drugs:* The WHO (World Health Organisation) roughly estimates that 10 per cent of medicine worldwide is counterfeit. The issue of counterfeit drugs is pressing, poses a risk to patients, and has a huge economic impact. Governments around the world are tightening the supply chain integrity to slow down the global flow of counterfeit medicines. Blockchain can help to resolve current challenges in the supply chain, by providing traceability until the point of delivery.

Back in 2020, Singapore-based Zuellig partnered with pharmaceutical company Merck to deploy eZTracker in Hong Kong, where it was used to trace vaccines for Human Papilloma Virus, Gardasil. Zuellig Pharma is also using eZTracker to track COVID-19 vaccinations to prevent practitioners from administering expired vaccines.

In 2021, [UNICEF](#) tendered the development of a blockchain solution for detecting counterfeit COVID-19 vaccines. It allows COVID-19 vaccines to be scanned and verified so their serial number can be compared with a blockchain-secured list of product codes generated by the manufacturers.\

3. *Enhancing Clinical Research:* Another important application of the technology is for ensuring patient privacy and data protection during clinical trials.

Pharma giants like Pfizer, Amgen, and Sanofi are looking to streamline the process of developing and testing new drugs by using blockchain technology. The companies believe the collaboration with blockchain technology may help to increase efficiency, accelerate the R&D process, and reduce drug development costs. Additionally, Boehringer Ingelheim (Canada) has partnered with IBM to improve trust, transparency, patient safety, and patient empowerment in clinical trials by using IBM's blockchain platform.

4. *Validating Returned Drugs:* In the pharmaceutical industry, wholesalers often ask for excess inventory and may need to return some products to the manufacturers. Returned drugs are then repackaged and resold. Globally, saleable returns account for about two percent of the entire commercial market. (Source: SAP)

Merck and American drug wholesale company AmerisourceBergen, is working with SAP to develop a blockchain-based solution that validates returned drugs. They tag drug shipments with identifiers by using SAP's app, Advanced Track and

Trace for Pharmaceuticals. The app can track the package and record whenever a transaction happens, allowing the manufacturer to verify its authenticity when returned.

5. *Boost R&D*: Blockchain in pharma can be beneficial in the drug discovery process in a number of ways. Blockchain provides the required robust IP protection, transparency and verifiability in real time across globally dispersed teams. In combination with other emerging technologies such as artificial intelligence and machine learning, blockchain in pharma could also improve data mining and analysis of information in published and newly generated research.

The Machine Learning Ledger Orchestration for Drug Discovery (Melloddy) is a three-year public-private consortium of ten major pharmaceutical companies, academic researchers, data scientists, and a major Artificial Intelligence company. The goal is to combine machine learning with blockchain technology to improve drug development. The project involves sharing huge amounts of data on the biological effects of billions of different small molecules. Each company would maintain control of its own data, but non-sensitive information would be shared for processing by machine learning algorithms. It is hoped that this project will give companies a much larger set of molecules to explore for new treatments. Blockchain is a key to the sharing, since it will allow for data sharing while still allowing each company to protect its intellectual property rights. The project started in June 2019 and will conclude in June 2022.

## **Challenges**

The technology is not without challenges though. The cost of development and implementation, lack of expertise and industry standards are some of the key considerations for the pharma industry.

Scalability is also an issue with most blockchain projects and storing data on a blockchain is expensive. Regulations around patient privacy make it difficult to get stakeholders onboard or provide third parties access to relevant but not identifiable information.

However, solutions to these problems are being explored.

Chrissa concluded that there is a promising future of blockchain in the pharma sector. As it is an emerging technology it is expected to open up new avenues for various industries, including pharma.

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