

## Open Learning Forum

### [Blockchain Technology for Detecting Falsified and Substandard Drugs in Distribution: Pharmaceutical Supply Chain Intervention](#)

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Executive Summary written by GBBC

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#### **Problem**

According to a 2017 World Health Organization [study](#), about 10% of medical products in low- and middle-income countries are substandard or falsified. Falsified and substandard medical products present serious health, economic, and socioeconomic threats to all countries – even high-income countries. The Food and Drug Administration’s [website](#) warns customers of counterfeit versions of drugs detected in the U.S., including: Botox, Cialis, Adderall, Tamiflu, Viagra, and cancer medications, among others. Experts agree that improved supply chain surveillance and management is the key to addressing this global crisis; blockchain technology is uniquely suited to be part of the solution.

#### **Solution**

Researchers at the University of the Philippines and the National Institutes of Health developed a Distributed Application (DApp) using smart contracts that can run on Ethereum and Hyperledger Fabric. The system uses a Distributed File System (DFS) to share information between each of the five starting nodes: (1) manufacturer, (2) wholesaler, (3) retailer, (4) FDA, and (5) consumer portal. Each node would have a radio-frequency identification (RFID) scanner and drug packages would carry an RFID tag.

Using the information supplied by the RFID scanners, the DApp would cross-reference the DFS and ledger entries to identify fraudulent activity or missing drugs. The FDA would be alerted of any suspicious activity and would determine whether to open an investigation. Additionally, consumers would be able to scan a code on their medication to see a detailed drug distribution history.

#### **Conclusion**

Blockchain technology offers a promising solution to the problem of substandard and fraudulent drugs. This system, if fully implemented, would provide full transparency for consumers, regulators, and manufacturers. However, this solution is not feasible in all countries, especially those with limited resources, weak or corrupt regulatory institutions, or a large black-market drug supply. While this solution does not solve all of the problems surrounding fraudulent and substandard drugs, it shows a clear path forward in which all parties in the drug supply chain work together using blockchain technology to ensure that consumers are receiving safe, effective drugs.