World Academy of Science, Engineering and Technology
International Journal of Computer and Systems Engineering
Vol:16, No:06, 2022

Challenges of Blockchain Applications in the Supply Chain Industry: A Regulatory Perspective

Authors : Pardis Moslemzadeh Tehrani

Abstract : Due to the emergence of blockchain technology and the benefits of cryptocurrencies, intelligent or smart contracts are gaining traction. Artificial intelligence (AI) is transforming our lives, and it is being embraced by a wide range of sectors. Smart contracts, which are at the heart of blockchains, incorporate AI characteristics. Such contracts are referred to as "smart" contracts because of the underlying technology that allows contracting parties to agree on terms expressed in computer code that defines machine-readable instructions for computers to follow under specific situations. The transmission happens automatically if the conditions are met. Initially utilised for financial transactions, blockchain applications have since expanded to include the financial, insurance, and medical sectors, as well as supply networks. Raw material acquisition by suppliers, design, and fabrication by manufacturers, delivery of final products to consumers, and even post-sales logistics assistance are all part of supply chains. Many issues are linked with managing supply chains from the planning and coordination stages, which can be implemented in a smart contract in a blockchain due to their complexity. Manufacturing delays and limited third-party amounts of product components have raised concerns about the integrity and accountability of supply chains for food and pharmaceutical items. Other concerns include regulatory compliance in multiple jurisdictions and transportation circumstances (for instance, many products must be kept in temperature-controlled environments to ensure their effectiveness). Products are handled by several providers before reaching customers in modern economic systems. Information is sent between suppliers, shippers, distributors, and retailers at every stage of the production and distribution process. Information travels more effectively when individuals are eliminated from the equation. The usage of blockchain technology could be a viable solution to these coordination issues. In blockchains, smart contracts allow for the rapid transmission of production data, logistical data, inventory levels, and sales data. This research investigates the legal and technical advantages and disadvantages of AI-blockchain technology in the supply chain business. It aims to uncover the applicable legal problems and barriers to the use of AI-blockchain technology to supply chains, particularly in the food industry. It also discusses the essential legal and technological issues and impediments to supply chain implementation for stakeholders, as well as methods for overcoming them before releasing the technology to clients. Because there has been little research done on this topic, it is difficult for industrial stakeholders to grasp how blockchain technology could be used in their respective operations. As a result, the focus of this research will be on building advanced and complex contractual terms in supply chain smart contracts on blockchains to cover all unforeseen supply chain challenges.

Keywords : blockchain, supply chain, IoT, smart contract
Conference Title : ICBIOT 2022 : International Conference on Blockchain in Internet of Things
Conference Location : London, United Kingdom
Conference Dates : June 27-28, 2022