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| Title | | A Comprehensive Analysis of Blockchain Technology and Consensus Protocols Across Multilayered Framework | | |
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| Abstract |  |
| Blockchain, a distributed and digital ledger technology, has the potential to transform several industries from cryptocurrencies to supply chains. However, the complexity of understanding the technology can be a challenge for most people, especially for newcomers. This study paper aims to provide an in-depth analysis and review of the different layers including the data, network, consensus, smart contract, and application layers. In this paper, we performed an in-depth analysis and review of the components of each layer. We also tried to simulate different consensus algorithms so a reader can understand which blockchain consensus algorithm can be chosen for a specific application. By reading this paper, a reader can understand the blockchain architecture and choose the right algorithms, languages and protocols for building their own blockchain network. The paper also addresses the challenges and difficulties of building a sustainable and secure blockchain. We believe that the choice of consensus algorithm is the most important thing for sustainability in a blockchain network. We show that some consensus algorithms use much more energy than others, and we suggest that developers choose consensus algorithms that use less energy. This paper is a great resource for anyone who wants to learn more about blockchain architecture and consensus algorithms. It gives a complete review of the subject and talks about the difficulties of making a blockchain that will be secure and sustainable. Researchers, developers, and anyone else interested in the future of blockchain technology will be interested in this study. | |