Chapter 9
Blockchain:
Emerging Trends, Applications, and Challenges

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ABSTRACT

A blockchain is a specific database stored in an electronic form. The databases stored in a block are put in a chain. When new data is added, it will be put in a new block. The blockchain may be created for storing different kind of information in which the most popular use of blockchain is ledger for transactions. Anything of value can be put in a blockchain, and this will reduce risk factors and cost. The blockchain is a chain of blocks used to store public databases. The blockchain can be a powerful tool in business applications for sharing and updating data. The blockchain may be used for the business process for handling transaction-related problems in an effective manner. The blockchain is also helpful in developing an ecosystem between various stakeholders. The policies, benefits, and cost are serious risk factors.

INTRODUCTION

The blockchain technology may be useful in insurance industry in various areas like sales, payments, assets transfer, claim processing and reassurance. The blockchain enabled applications may be helpful in government sectors also. The blockchain based governance may offer services used by state and its authorities in a decentralised manner. The blockchain based applications may be helpful in public services like patent management, income tax payment, marriage registration etc. Due to the increasing

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attention of decentralised IoT platform, the block chain technology is playing crucial role in offering various services. The idea is to exchange data in a heterogeneous manner by interconnecting smart IoT devices, the blockchain technology is offering secure real-time payment services helping enhancement of ecommerce industry. The blockchain based IoT applications decrease maintenance cost of centralised servers. It also provides security to IoT and wireless sensors networks. The role of blockchain in energy sector with overview of key principles and detailed review of energy applications and use cases with benefits and limitations of blockchain is well explained (Merlinda Andoni, Valentin Robu, David Flynn, Simone Abram, Dale Geach, David Jenkins, Peter McCallum & Andrew Peacock,2019). The authors proposed law and policies for reducing energy consumption of Blockchain technologies (Jon Truby,2019). The authors discussed the role of Blockchain ecosystem for carbon markets including environmental assets, rights and liabilities in implementation (Galenovich, Lonshakov & Shadrin.2018). Different Blockchain schemes were analyzed by the authors (Tommy and Poll, 2018). The technical principles, role and policies for implementing Blockchain is studied. The author discussed the role of ethereum in secure transactions and smart contracts as well as scalability issues were also analyzed (Imran Bashir, 2018). A new distributed and tamper proof media transaction framework for blockchain model was proposed for securing transactions (Bhowmik, & Feng,2017). An article discussing the use of Blockchain to fight land ownership fraud was written(Browne, R. 2017). To provide security and privacy Blockchain technology based voting system is proposed (Hjalmarsson, Hreioarsson, Hamdaqa, & Hjalmtysson,2017). There are billions of devices to connect to IoT sensors and devices. But the current model of client server may have problem with synchronization. A new model using Blockchain is proposed by IoT system. This model is able to control and configure devices. An encryption algorithm is also proposed to secure the transactions (Huh, Cho, & Kim, 2017). It is not safe to put contracts, transactions and records information online butBlockchain technology can be solution to this kind of problem. The Blockchain provides open, distributed ledger which records the transactions safely and efficiently. The intermediaries like bankers and lawyers role can be slashed to transform economy (Iansiti, & Lakhani,2017). The authors have discussed the points related to Blockchain popularity and also issues like scalability, traffic monitoring is discussed (Imbrex & Sharding 2017). The use of Blockchain technology for IPR management with its operation and maintenance issue is discussed (Ito, Kensuke and O'Dair, 2019).