Chapter 14
Significance of Blockchain Technology in Banking: Introduction and Challenges

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ABSTRACT

Blockchain, the technology that supports Bitcoin, has recently received a lot of attention. Blockchain acts as an unchangeable record that allows decentralised transactions to take place. Blockchain-based applications are getting popular in a variety of industries, particularly financial services, reputation management, the internet of things (IoT), and many others. Furthermore, there are still a number of issues with blockchain technology to address, including scalability and security concerns. This chapter provides an in-depth look of blockchain technology.

INTRODUCTION

The core of blockchain is distributed ledger technology (DLT). DLT uses a network of computers to provide a consensus validation method for peer-to-peer transactions, eliminating the need for an intermediate or centralized authority to update and preserve the information created by the transactions. Every transaction is verified before being included as a new "block" to an already current chain of transactions, hence the name "blockchain". A transaction can't usually be changed or deleted after it's been introduced to the chain.

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Bitcoin has been a major success as among the most prominent cryptocurrency, with its capital market surpassing $10 billion in 2016 (S. Nakamoto,2016). Transaction in the Bitcoin network would take place without the involvement of a third party if an especially developed data storage structure was used, and the key technology used to develop Bitcoin is blockchain, which has been initially suggested in 2008 and executed in 2009 (S. Nakamoto,2008). All committed transactions are saved in a chain of blocks, which may be thought of as a public ledger. This chain continues to develop as additional blocks are added to it. For personal authentication and ledger integrity, asymmetric cryptography and distributed consensus techniques have been employed. Decentralization, consistency, privacy, and integrity are all fundamental aspects of blockchain technology. With these characteristics, blockchain may significantly reduce costs and increase efficiency.

Blockchain may be utilized in a variety of financial services, including digital content, remittances, and online payment (G. W. Peters, E. Panayi, and A. Chapelle, 2015) as it enables payment to be completed without the involvement of a bank or an intermediary. It may also be used in other areas, such as smart contracts (A. Kosba, A. Miller, E. Shi, Z. Wen, and C. Papamanthou,2016) government services [6], the Internet of Things (IoT) (Y. Zhang and J. Wen,2015) reputational systems (B. W. Akins, J. L. Chapman, and J. M. Gordon,2013) and security services (C. Noyes, "Bitav,2016). In a variety of ways, these industries benefit from blockchain. To begin with, blockchain is an immutable digital ledger. When one transaction is recorded in the blockchain, it could not be altered. Blockchain may be used to build a client base for businesses that demand a high level of dependability and honesty. Furthermore, because blockchain is distributed, it avoids the problem of a system failure. When it comes to smart contracts, after they've been distributed on the blockchain, miners may be able to readily execute them.

The Unique Value of Blockchain

Blockchain provides a fundamental shift from the traditional Internet of information and communications to the Internet of Value, assuring the establishment of trust, achieved through the application of blockchain technology between strangers. This simple, but ground-breaking, advantage is likely to bring disruptive changes. Briefly, the unique value of blockchain can be summarized as follows:

- **Trust:** New information can be added to the blockchain ledger only when the majority of network participants give their approval, after receiving satisfactory proof that the information, transmitted cryptographically, is truthful. The authentication of information is done in short intervals of time