Chapter 2
Blockchain Technology in Peer-to-Peer Transactions Emphasizing Data Transparency and Security in Banking Services

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ABSTRACT

The banking system serves as the central and essential component of a functional economy. A robust banking system is essential for fostering economic growth and facilitating development. However, the systems have certain drawbacks Numerous instances of fraudulent operations were reported, leading to clients experiencing theft and unauthorised access to their properties. With the progression of the digital era, there is an increasing exposure and scrutiny of these centralized systems, thereby leading to a shift in thoughts towards decentralised alternatives. This chapter provides a concise discussion of the necessity of decentralised financing and how it can be accomplished through the utilisation of blockchain technology. Firstly, the study examines the mechanics of decentralised banking systems and their potential to address the limitations of conventional banking systems. Further, a brief of various case studies has been given. Finally, the chapter discusses the transformation of the banking system using blockchain technology.

1. INTRODUCTION

Blockchain technology has gained significant attention in recent times. The utilization of this technology has been observed across several sectors, with the financial industry emerging as the primary

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adopter. Blockchain and distributed ledger technologies have emerged as potent tools for facilitating decentralization through the promotion of trust and transparency. The centralized banking systems are commonly employed across the world for financial transactions; however, certain limitations, such as the lack of data openness and instances of fraud, have prompted an option towards decentralized systems (Nofer *et al*., 2017). According to Tasatanattakool and Techapanupreeda (2018), blockchain is defined as "*a decentralized and distributed digital ledger that is used to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the collusion of the network*". It is composed of interconnected blocks, with each block containing several transactions. The blockchains are expanded by incorporating further blocks, resulting in a comprehensive record of transactions in the form of a complete ledger (Kaur, 2023). One of the primary benefits of utilizing a decentralized ledger is the inherent visibility of recorded data to all participants within the network. This characteristic fosters data transparency since it prevents any individual from altering or deleting the data (Sarmah, 2018). Consequently, the occurrence of data fraud is significantly minimized.

Blockchain technology has the capacity to facilitate decentralization through a range of mechanisms, including trustless transactions, decentralized applications (dApps), smart contracts, immutable records, supply chain transparency, democratic governance, resistance to censorship, global accessibility, data ownership, and financial inclusion, among other potential contributions Blockchain technology is rapidly being adopted in various sectors and is projected to grow even faster in the coming years. Nevertheless, it is crucial to acknowledge that the adoption of these technologies entails the disadvantage of heightened energy consumption and the necessity to overcome legislative obstacles to fully exploit their decentralized capabilities.

Sectors adopting blockchain technology range across banking and finance, retail, healthcare, telecom, travel and transportation, government, energy, entertainment and media, and others as with emerging technology and innovations, companies' growth opportunities in relation to digitalization also increases. It is to be noted that sizable investments from various companies across countries are being currently invested in blockchain. The chart below (Figure 1) shows the blockchain market globally is at USD 11.14 billion in 2022 and by 2030 it is expected to be at around USD 469.49 billion, which means a compounding increase of around 59% annually (Fortune Business Insight, 2023).

Among all other sectors, the financial sector has the potential to undergo transformation through the use of blockchain technology. The capacity to enhance security, efficiency, and transparency and foster novel inventions in the finance domain is supported by the technology. The use of robust security measures ensures the integrity of data, and hence minimising the likelihood of fraudulent acts performed by individuals. The integration of blockchain technology within financial institutions can yield cost savings by virtue of removing intermediaries and automating certain operations (Garg et al., 2021). The speed and convenience of the transactions contribute to an improved client experience. Blockchain technology serves as the fundamental infrastructure for decentralised finance, facilitated by the utilisation of smart contracts. Decentralized finance is a novel alternative to the existing finance system as it delivers financial tools to the customers without intermediaries like brokers or banks by using these smart contracts generated with blockchain technology (Zetzsche et al., 2020). Generally, smart contracts are contractual agreements that possess the ability to autonomously execute and exhibit programmable behaviour, functioning inside the framework of a blockchain. The contract is performed automatically, without the need for any middleman, when certain prewritten conditions set in code are satisfied.