Chapter 1
Integration of the Internet of Things and Blockchain to Promote Collaboration in Smart Cities:
A Case Study in China

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ABSTRACT

This chapter aims to explore the importance of the convergence and collaboration of the internet of things and blockchain in enabling the development of smart cities. It will capture the strong link between the burgeoning advanced technology and China's fast-growing smart cities. In addition, the authors used the CiteSpace bibliometric tool to analyse the core journals related to smart cities, IoT, and blockchain in WoS and CNKI operations and visualise the relationships between the literature as a scientific knowledge map. The research topic in this chapter focuses on the keywords with the highest frequency and determines the research frontier and trend. This chapter will further explore the roles of the government in promoting the integration of the internet of things and blockchain in the development agenda of industrial infrastructure and smart cities through policies (i.e., institutions).

INTRODUCTION

With the massive application of Internet of Things (IoT) terminal devices in the infrastructure, the shortcomings of low rate, low connection density and time latencies make it difficult for the traditional 4G

network to support the future needs of smart city development and construction. The development of 5G networks has become a common choice to enhance urban development, innovate industrial development and realise the overall interconnection. 5G technology is closely related to national development, economic growth and industrial breakthroughs, and the 5G communication standard is not only a technical standard, but also of strategic importance to China's industrial development. From the perspective of connectivity development, the 2G era is like a hanging chime, 3G era is showing its head, 4G era is catching up. In the 5G era, China's goal has changed from being a runner to a leader. This will greatly promote the development of China's communications industry and national economy.

New technologies such as 5G and smart city construction show a complementary relationship, just like the organs that support the operation of the human body, emerging technologies provide technical support for the efficient operation of smart cities, while smart city construction promotes the application and continuous development of new technologies. 5G network technology has three main characteristics: ultra-high speed, ultra-large connectivity and ultra-low latency, and combined with future network slicing services and edge computing capabilities, it can layout 5G. Emerging information technology convergence can give full play to the key enablers of data, algorithms, computing power and distributed networks to promote the rapid development of smart city transportation, finance, government, environment and healthcare industries (Yu, Xu, Cheng & Sampat, 2023; Trivedi et al., 2021; Yu, Lu, Hanes & Chen, 2022; Yu, Lu, Sampat, Li & Ahuja, 2022; Yu, Ge, Mandizvidza & Mulli, 2023; Yu, Zhang, Sampat & Chen, 2023; Yu, Xue & Mahendran, 2022). Only by establishing a credible and secure information environment can smart cities operate efficiently, transparently, safely and credibly.

LITERATURE REVIEW

1. IoT & Smart City

The term IoT was first coined by Kevin Ashton in 1999 with reference to the supply chain management (Ashton, 2009). The concept of IoT revolves around the word ''smartness'', which means ''an ability to independently obtain and apply knowledge'' (Ahmed et al., 2016). Therefore, IoT refers to the ''things or devices and sensors'' that are smart, uniquely addressable based on their communication protocols, and are adaptable and autonomous with inherent security (Bhabad & Bagade, 2015).

With the continuous development of science and technology, IoT technology is appearing more and more in our daily life, and is also receiving more and more attention from all walks of life. Especially in recent years, the IoT has provided great opportunities for the development of various industries (Yu, Liu, Hanes & Mumtaz, 2022), especially in smart city construction (Kim et al., 2017). Smart cities, as well as smart governance, rely on collecting, analysing and processing large amounts of granular real-time data, which can only be achieved with the help of IoT sensors (Cirillo et al., 2020). IoT sensors and cameras can continuously collect detailed data in various forms and in real time, and by using this data, government agencies can make quick decisions on the allocation of different resources and assets (Lee & Lee, 2015).

2. Blockchain & Smart City

"Data" has become a resource in the new context of flourishing information technology, especially with the development of cities, which have the potential to accumulate a large volume of data. However,

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