

# Chapter 17

## Study on Blockchain– Integrated IoT: Reorientation With Amalgamation of Heterogenic Devices

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### ABSTRACT

*The continuous development of interconnected devices is reconstructing livelihood and with the emergence of advanced technology yields growth in the usage of IoT devices. Though it is revolutionary and brings convenience, it faces different security challenges. The transition from traditional to smart in varieties of sectors makes the use of IoT technologies to become an integral part of lives which obviously requires a protection shield that can be offered by Blockchain. Blockchain's protected decentralization overcomes different hazards the IoT structure is facing. In this chapter, the authors have represented a detailed study on IoT, its layer and applications, a comparative analysis of different security threats, how an association with blockchain would mitigate different shortcomings of present IoT architecture, and the issues that exist in Blockchain-associated IoT.*

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## INTRODUCTION

To understand the prospect of Blockchain-associated IoT, a clear understanding of both technologies is crucial. In the year 1999, the great computer scientist Kevin Ashton coined the term Internet of Things (IoT). He proposed attaching an RFID (Radio Frequency Identifier) tag to the object to track it online. IoT gained momentum as devices with embedded sensors and connectivity capabilities began to proliferate. The rapid growth of IoT may lead to the Internet of Everything. Blockchain's distributed nature offers a secure and transparent way to address IoT's challenges, enhancing trust and security in data sharing. This article aims to explore the dynamic relationship between Blockchain and IoT, the potential advantage of merging blockchain with IoT, exploring how this synergy can revolutionize industries, elevate data integrity, and cover the way for a more interconnected and secure world. Additionally, it seeks to shed light on the challenges and limitations that arise in implementing blockchain in IoT environments with a probable solution given by many researchers.

## NEED FOR IOT IN THE CURRENT MARKET

IoT is a driving force in today's connected world, offering businesses and consumers opportunities for growth, efficiency, and innovation. Addressing key areas in the market is essential.

- **Enhanced Connectivity:** IoT enables seamless communication between devices, systems, and users, facilitating real-time data exchange and analysis.
- **Smart Automation:** IoT drives efficiency and cost reduction through intelligent device integration and process automation.
- **Data-Driven Insights:** IoT generates valuable data for informed decision-making and innovation.
- **Industry Transformation:** IoT revolutionizes healthcare, manufacturing, agriculture, and transportation with remote monitoring and predictive maintenance.
- **Improved Quality of Life:** IoT innovations enhance daily living through smart homes, wearables, and health monitoring, promoting convenience and safety.

The Internet of Things (IoT) is the arrangement of interconnected devices and sensing devices built into our daily lives. In 2005, the ITU officially recognized the IoT concept. McEwen et al. (2013) proposed an equation that describes vital components of the IoT:

$\text{IoT} = \text{Physical Object} + \text{Controller, Sensor, and Actuators} + \text{Internet}$  (as shown in Figure 1).

The definition of IoT has been changed to the following equation by Atzori et al. (2017).

$\text{IoT} = \text{Sensors} + \text{Data} + \text{Services} + \text{Networks}$  (as shown in Figure 2).

Earth is adapting to the rapidly embryonic technologies along with the interconnection of different heterogeneous devices and technologies, which is pushing us continuously toward the use of IoT. Figure 3 shows the advantages of IoT.

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