

Chapter 11

Aroma of Highly Smart Internet of Medical Things (IoMT) and Lightweight EdgeTrust Expansion Medical Care Facilities for Electronic Healthcare Systems: Fortified-Chain Architecture for Remote Patient Monitoring and Privacy Protection Beyond Imagination

Bhupinder Singh

 <https://orcid.org/0009-0006-4779-2553>

Sharda University, Greater Noida, India

Christian Kaunert

 <https://orcid.org/0000-0002-4493-2235>

Dublin City University, Ireland

ABSTRACT

The internet of medical things (IoMT) represents a paradigm shift in healthcare, ushering in an era where web-connected devices seamlessly collect, transmit, and analyze crucial health-related information without the need for direct human intervention. The rapid evolution of internet of things technologies has paved the way for innovative solutions in the medical domain. IoMT extends this progress into healthcare by integrating a plethora of smart, connected devices that operate proactively across various facets of the medical ecosystem. These devices, ranging from wearable sensors and implantable devices to intelligent hospital equipment, form a comprehensive network that significantly enhances the efficiency, cost-effectiveness, and personalization of healthcare services. The applications of IoMT discussed in this paper underscore its potential to revolutionize the way healthcare is delivered and received, shaping a future where technology and medicine converge for the betterment of global health.

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INTRODUCTION

The advent of the intelligent smart Internet of Things (IoT) has brought about transformative changes in various domains, and perhaps none more so than the field of healthcare. Within this IoT ecosystem, the Internet of Medical Things (IoMT) stands out as a technological marvel, redefining the way healthcare services are delivered and managed. IoMT encompasses a vast array of medical devices, sensors, and wearables, all seamlessly interconnected through the power of the internet. These devices extend healthcare providers' reach outside typical hospital settings, allowing for remote patient monitoring and an unprecedented level of individualized treatment. Medical practitioners can get real-time patient data, track health metrics, and respond to important occurrences in seconds with IoMT, all from the comfort of their clinics or even their own homes (Bangui et al., 2023). This technology advancement has created a new world of possibilities for patients, lowering healthcare expenses and, most significantly, saving lives by permitting prompt interventions.

IoMT applications' tailored features further adapt medical procedures to the demands of specific patients. IoMT ensures that healthcare is not only more effective but also specifically tailored to the needs of each patient. It does this by utilizing adaptive medical devices that modify parameters depending on real-time physiological data and personalized treatment plans created through machine learning algorithms. The difficulties and factors that must be taken into account for the general adoption of IoMT, such as data security and privacy issues, interoperability problems, and the requirement for standardized protocols, will be covered in this article. To fully realize the promise of IoMT and ensure a seamless integration into the healthcare ecosystem, it is imperative to address these issues. A proactive, effective, and personalized healthcare experience will be made possible by technology in the future, according to the Internet of Medical Things, which is transforming healthcare (Liu et al., 2023). By fortifying the edges of the network with Lightweight EdgeTrust Expansion, healthcare providers can ensure that patient data remains confidential, unaltered, and accessible only to authorized personnel, thus mitigating risks and reinforcing trust in electronic healthcare systems.

This search for an architecture that not only assures the security and integrity of patient data but also promotes the cause of privacy preservation becomes vital in the dynamic environment where the IoMT and Lightweight EdgeTrust Expansion intersect. The idea of "Fortified-chain Architecture" for remote patient monitoring develops in this setting as a ground-breaking strategy that goes beyond conventional healthcare infrastructure. This design combines Lightweight EdgeTrust Expansion and IoMT devices with edge computing nodes and blockchain technologies to build an effective, private, and secure ecosystem for electronic healthcare systems. Patient data is protected from breaches and illegal access because to the fortified-chain architecture, which creates a smooth connection between patients, healthcare professionals, and smart devices (Joyia et al., 2017). This paper launches a thorough investigation of the Smart Internet of Medical Things and Lightweight EdgeTrust Expansion in the context of medical care facilities in the quest to give healthcare services that are beyond the dream of earlier generations. It explains the many parts, features, and advantages that this fortified-chain architecture offers in the context of remote patient monitoring by delving into the complexities of it. Additionally, it scrutinizes patient privacy safeguards with a critical eye, pushing the bounds of morality and legality to protect the integrity of medical data.

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