Chapter 4
Revolutionizing Healthcare With Cloud Computing:
Opportunities, Challenges, and Innovations for Secure Patient-Centered Systems

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ABSTRACT

Cloud computing is revolutionizing healthcare by improving service quality, efficiency, and affordability, while also addressing the evolving challenges in patient care. With the rapid digital transformation in healthcare, cloud-based systems offer new opportunities for data storage, patient monitoring, and healthcare management.

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However, as more sensitive medical data moves to the cloud, security concerns regarding data privacy and third-party remote storage become critical issues. This research examines the potential of healthcare cloud computing, highlighting its benefits and challenges, including security and legal considerations. The paper introduces TDBNN, a deep learning-based system designed to enhance the security of cloud-stored healthcare data, ensuring better protection of patient privacy. This work provides insights into the future of cloud-based healthcare systems and their implications for patient-centered care.

1. INTRODUCTION

Healthcare is a constantly looked upon and ever more broadly defined foundation of social comfort, whose main concerns revolved around the promotion, observation and preservation of the health of people. The incorporation of the cloud computing networks in the healthcare systems has in the past years led to many innovations to enhance the quality and accessibility of the healthcare services. The world healthcare market is changing fast with an emergence in demands of cost-effective, efficient, and high quality healthcare services (Boudlal, Serrhini, & Tahiri, 2022). One of such technologies that have taken important space in this sector is cloud computing which has helped to improve healthcare delivery to be smarter and efficient. These new developments can be aimed as bettering the quality of healthcare services as well as minimizing costs and patient misery, providing an easier and patient-centered healthcare society (Sobhy, El-Sonbaty, & Abou Elnasr, 2012).

Although the benefits of the cloud computing in the healthcare are considerable, its implementation comes with a challenge, especially in the safety and lawfulness of data. One of the most serious issues is safety of sensitive information about the patients kept remotely by third-party vendors. The risk of data leaks of malicious use of such data is quite serious, which is why the security question lies at the heart of mass adoption of cloud technologies in the medical field (Agapito & Cannataro, 2023). In this way, the proposed study is supposed to describe the opportunities and difficulties connected with cloud computing in healthcare with the references to the security aspect and the ways of dealing with the challenges. This paper can help the existing debate on the role of cloud computing in changing the healthcare system by analyzing the existing case studies and offering practical insights.

The healthcare industry has experienced accelerated growth of technologies, which are based on clouds and which have increased efficiency, flexibility, and scale of applications. Nevertheless, with the transfer of medical data to the cloud, keeping private data of sensitive patients a priority is underway. The proposed paper will discuss the implementation of cloud computing in the health sector, and the new