Chapter 3
Issues and Challenges of Metaverse in the Healthcare Domain

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ABSTRACT

In the rapidly evolving landscape of healthcare, the emergence of the Metaverse presents a promising yet complex frontier. The chapter begins by providing an overview of the Metaverse, exploring its fundamental concepts, and highlighting its potential benefits for the healthcare industry. It then proceeds for challenges that healthcare professionals, researchers, and stakeholders may encounter in this transformative journey. With the Metaverse's immersive and interconnected nature, safeguarding patient data and ensuring secure communication channels are paramount. The chapter examines the vulnerabilities in the Metaverse and explores strategies to protect sensitive medical information. The chapter concludes with a forward-looking perspective on how the healthcare industry can harness the Metaverse's potential

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while mitigating the associated issues and challenges. It emphasizes the importance of interdisciplinary collaboration between healthcare professionals, technologists, policymakers, and ethicists to navigate this uncharted terrain successfully.

INTRODUCTION

In the digital age, the convergence of technology and healthcare has ushered in a new era of possibilities, paving the way for a profound transformation in the way we deliver and experience medical services. At the heart of this revolution lies the concept of the Metaverse, a multifaceted virtual realm that extends far beyond the boundaries of conventional cyberspace (Prasad,2023). As we navigate the 21st century, the potential of the Metaverse in the healthcare domain is nothing short of revolutionary. The Metaverse, a term originally popularized in science fiction, has transitioned from the realm of imagination into tangible reality, offering an immersive and interconnected digital universe where users can interact, collaborate, and create in ways previously unimaginable (Agarwal, 2023). In the healthcare domain, the promise of the Metaverse is immense, offering innovative solutions for patient care, medical training, and even therapeutic interventions. This amalgamation of digital technology, artificial intelligence, augmented reality, and virtual reality has the potential to redefine the healthcare landscape and enhance the quality of life for individuals around the world. As we navigate this uncharted territory, it is crucial to maintain a delicate balance between embracing the transformative power of the Metaverse and safeguarding the essential human elements of healthcare—compassion, empathy, and human touch. The term "Metaverse" gained widespread recognition when Facebook underwent a corporate rebranding, adopting the name Meta in October 2021, and unveiling intentions to allocate a minimum of $10 billion towards the realization of this concept during that year. Furthermore, not only Meta but also tech industry behemoths such as Google, Microsoft, Nvidia, and Qualcomm have committed substantial financial resources, investing billions of dollars into this emerging concept. The metaverse embodies the collective vision held by many within the computer industry, representing what they anticipate as the forthcoming evolution of the internet. It envisions a unified, immersive, enduring, three-dimensional virtual realm where individuals can encounter life in novel ways that go beyond what the physical world can offer. While certain technologies facilitating access to this virtual domain, like virtual reality (VR) headsets and augmented reality (AR) glasses, are rapidly advancing, other crucial elements required for the metaverse, such as ample bandwidth and standardized interoperability, may still be years away from realization or might never come to fruition (Prabhu,2015). Two pivotal technologies that play a significant role in shaping and expanding the