

Chapter 8

Human–Machine Interaction in the Metaverse in the Context of Ethiopia

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ABSTRACT

For developing nations like Ethiopia, the idea of human-machine interaction (HMI) in the burgeoning metaverse offers both potential and problems. It is critical to comprehend the changing dynamics of HMI in this new digital arena. This chapter examines the current situation of HMI in Ethiopia, including its possible advantages, difficulties, and moral implications. The backdrop gives a summary of the metaverse and its expanding influence, proving that HMI analysis is necessary in this revolutionary technological environment. The chapter looks at several uses of the metaverse, ranging from social interaction and entertainment to virtual labor and education. It examines the potential that mobile apps provide to Ethiopia. But the conversation also explores the difficulties brought on by practical problems. With an emphasis on the Ethiopian experience, this chapter provides an extensive analysis of the changing HMI dynamics inside the metaverse. It seeks to add to the current conversation about the ethical advancement and use of metaverse, especially with regard to impoverished countries.

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INTRODUCTION

Decades of study and development have gone into the idea of human-machine interaction (HMI), with early adopters setting the groundwork for more user-friendly and effective interfaces between people and technology (Nardo et al., 2020). However, the nature and complexity of HMI have changed dramatically as the digital world has developed, especially with the introduction of immersive technologies like virtual and augmented reality (Gonfa & Kekeba, 2022).

The potential advantages and difficulties of the metaverse have not been sufficiently covered in the literature on HMI that is currently available in Ethiopia (Ayano, 2023). In the context of virtual and augmented reality, in particular, traditional HMI approaches like keyboard-and-mouse interactions and touch-based interfaces sometimes fail to capture the richness and complexity of human experiences. According to Jabo et al. (2024), these interfaces may be difficult to use, counterintuitive, and unable to fully utilize the spectrum of human sensory and cognitive capacities.

By performing a thorough research of HMI in the metaverse and concentrating on the Ethiopian experience, this chapter seeks to close this gap. In Ethiopia's distinct cultural, economic, and technical environment, the chapter will offer a comprehensive understanding of the emerging dynamics of human-machine interaction by utilizing both theoretical models and empirical data from the worldwide study scene. The creation of more user-centered and inclusive metaverse apps will be influenced by this study, which will eventually help ensure the responsible and fair integration of these revolutionary technologies throughout the nation.

The idea of the metaverse has attracted a lot of attention from all over the world, offering a vision of an entirely immersive virtual environment where people can interact with other users and virtual environments in ways that are similar to the real world (Ke et. al., 2018). As this idea becomes more popular, it is important to think about the implications of human-machine interaction (HMI) in the metaverse, particularly in the context of Ethiopia (Gonfa & Kekeba, 2022). The metaverse is a collective virtual shared space that is created through the convergence of virtual reality, augmented reality, and the internet (Kun, 2018). It goes beyond the bounds of traditional virtual reality platforms, providing a seamless and connected virtual environment where people can work, socialise, learn, and engage in a variety of activities (Nardo et. al., 2020).

The metaverse HMI is quite significant in Ethiopian contexts. A key factor in determining the nation's digital destiny as it adopts technological innovations and digital transformation is comprehending and optimising HMI inside the metaverse (Ayano, 2023). In the metaverse, effective HMI is essential for a number of reasons. First of all, it makes it possible for users to easily traverse and engage with the virtual surroundings (Nardo et. al., 2020). A more engaging and pleasurable user

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