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# Beyond Your Sight Using Metaverse Immersive Vision With Technology Behaviour Model

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## ABSTRACT

With the advancement of technology, the metaverse image is used to improve the success rate of surgical. The purpose of this study was to understand the acceptance of extended reality surgery by different populations of medical experts and patients. The main reason for using a triangular mixed model for the study is because of the small amount of relevant research data for this study, quantitative research, exploratory research, and cross-sectional research can avoid some human interference and reduce error. The results of the study data showed that the image model, interaction design, surgeon, and clarity of use of the head-mounted display with metaverse technology by the expert group were conducive to improved surgical success rates. Metaverse surgery offers opportunities for modern digital surgery and can effectively improve the expert's ability to promote the smoothness of physical indicators during the procedure. This study is pioneering the role of a metaverse in facilitating surgery from the dual perspective of medical experts and patients.

## KEYWORDS

Extended Reality, Hyper Visual, Imaging, Immersive, Metaverse, Technology Behavior Model

## 1. INTRODUCTION

Metaverse is a concept based on extended reality technology beyond the universe, a three-dimensional space of virtual reality parallel to reality (Bibri & Allam, 2022; Mystakidis, 2022). In the field of medical imaging, digital transformation has a profound impact on image processing analysis of structural images of the human body and realistic contexts (Zhang et al., 2022). Extended Reality

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(XR) technology is a new technology combined with Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR)(Sugimoto, 2022). Virtual reality technology enables virtual surgery, which can be used for students to simulate and predict problems that arise during surgery, by virtually constructing models of human structures and performing surgical simulations (Boedecker et al., 2021; Pringle et al., 2022). Augmented reality technology enables the construction of 3D graphics based on physical images by overlaying virtual objects with multiple images and digitization (Kaplan et al., 2021). both VR and AR are virtual behavioural representations of an indirect representation of the real world. XR is a computer-formed virtual and real environment that can be combined to make the environment more realistic and believable (Alizadehsalehi et al., 2020). It enables people to observe more intuitively the three-dimensional relationship between the tissues and organs, blood vessels and nerves inside the human body, as well as the complex movement of muscle tissue and microbial movement (Alizadehsalehi & Yitmen, 2021; Andrews et al., 2019; Beams et al., 2022).

The use of head-mounted displays (HMDs) in interventional procedures uses virtual technology of extended reality combined with human medical image data (figure 1) to create a model that fits the patient's actual condition (Nakamatsu et al., 2022; Ong et al., 2021). It can better help surgical experts in pre-surgical protocol design and surgical planning (Sadeghi et al., 2022). On the other hand, it facilitates the patient's preoperative information and understanding (Arpaia et al., 2022). The head-mounted display enables surgical experts to share images and videos, while teaching and communicating with remote and real-time guidance and assistance. In research by Verhey, et al. (Verhey et al., 2020), using Microsoft HoloLens for open orthopaedic surgery, experimental results showed a significant increase in contrast perception, as well as a reduction in operative work time and increased operational efficiency. In spinal medicine research, the use of intelligent technology can effectively improve the performance of data acquisition, communication, and access (Sommer et al., 2022). In particular, telemedicine requires extremely high CT resolution, high-definition cameras, high-performance da-ta network transmission (Patil & Kumar, 2019), editable holograms (Velazco-Garcia et al., 2021), and HMDs to allow easy viewing of content in real-time to make timely and accurate diagnoses and decisions (Diaka et al., 2021). The high performance of digital transformation provides the feasibility of using intelligent technology in surgery, further expanding the use of metaverse, XR in clinical surgery(Tan, 2022).

**Figure 1.**
**Head-mounted displays surgery**