# Chapter 13
# Integrated Geospatial Information Management in the World of Metaverse:
## Challenges and Opportunities

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## ABSTRACT

*Transformative discoveries are available across several disciplines because of the convergence of integrated geospatial information management with the Metaverse. Through the study of geospatial data, integrated geospatial information management (GIM) offers useful insights that can support emergency response, transportation, and urban planning. Immersive encounters, virtual travel, brand activation, cultural preservation, education, healthcare, and entertainment can be possible by the metaverse. The Metaverse's integration of GIM can improves visualization, teamwork, decision-making, and data sharing. However, issues like interoperability, data accuracy, and data privacy require special consideration. Accepting the potential of GIM in the metaverse can opens doors for creative developments across many industries, promoting societal improvement and improving user experiences in virtual settings.*

## INTRODUCTION

The concept of the Metaverse has garnered significant interest across industries, society, and scientific communities alike. However, there is currently a lack of a universally accepted scientific definition for this concept (Weinberger, 2022). According to Davis et al., (2009), a virtual environment that incorporates

aspects of the actual world with immersive digital experiences is called the Metaverse. Using avatars and holograms, it allows users to move between the real world and the virtual world with ease. The idea of the Metaverse has received a lot of attention and is predicted to revolutionize several industries, including marketing, tourism, gaming, entertainment, and education. Users can take part in a variety of activities, including social interactions, virtual travel, and the building of virtual worlds. According to statistics from Google Trends, the phrase "Metaverse" is becoming more popular across several nations. The search volume index is shown in Figure 1 and illustrates the amount of interest in various geographic areas. The numbers show that there is a large volume of searches in particular nations, with China leading the pack with 100, followed by Singapore with 82, the United Arab Emirates with 70, Turkey with 65, and Hong Kong with 65. These figures show how widely the idea of the Metaverse is being discussed and how much interest there is in it.

*Figure 1. Metaverse interest by region*
*(own diagram based on data from Google Trends)*
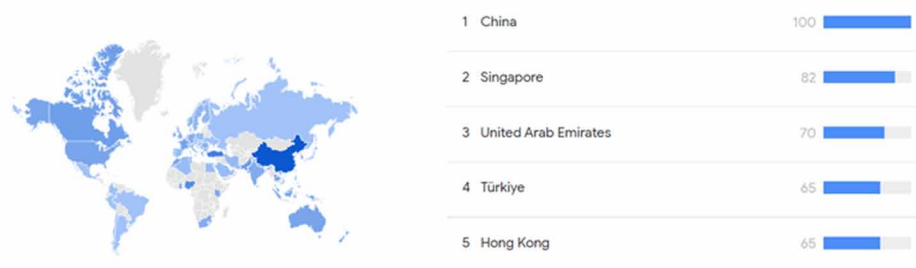


The gathering, processing, and visualization of geographical data are the main objectives of integrated geographic information management. This calls for the employment of tools like satellite photography, remote sensing, and geographic information systems (GIS). Geospatial information offers useful insights into the features and spatial relationships of the Earth's surface, including its topography, built environment, and natural resources.

For many different businesses and areas, the integration of GIM into the Metaverse has enormous promise. Real-world geospatial data and virtual environments can be used to create immersive experiences, improve decision-making, and revolutionize industries including entertainment, urban planning, tourism, and crisis management. This integration offers strong justification for investigating the connections between GIM and the Metaverse and comprehending their future ramifications. It is crucial to dynamically generate interactive virtual reality environments that accurately represent real-world settings to enable immersive visualization, exploration, and analysis of spatial data within a geographical information system. Users should be able to engage physically with the data in these settings, which will enhance the realism and interest of the encounter (Abdalla & Esmail, 2019).

The overall objective of this chapter is to investigate how geographic information management may be used in the Metaverse. This chapter will examine the interaction between geospatial data management and virtual worlds, emphasizing how geospatial data can be used in the immersive settings of the Metaverse.

To achieve the objective, the rest of the chapter is organized as follows. Section 2 defines geospatial information management and discusses its significance in many fields, including transportation, emer-

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