

# Systematic Literature Review on Metaverse Library

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## ABSTRACT

The development of technology and information has now gone digital with the emergence of the meta-world or metaverse. Libraries as evolving organisms need to adapt to keep up with the times and meet the needs of their patrons. This study aims to determine the extent to which research related to metaverse libraries has been carried out and how libraries can answer the challenges of digital technology developments related to metaverse technology. The method used in this research is a Systematic Literature Review using the Publish or Perish and Vos Viewer applications with the period publication analysis from the years 2014-2023. The results showed that articles related to the metaverse library are still very limited when compared to articles that discuss the metaverse itself. On the other hand, libraries are expected to continue to develop with the concept of Metaverse Library with consideration as a form of innovation to improve immersive learning, accessibility, information preservation, and collaboration globally.

**Keywords:** Digital Trends; academic library; metaverse library

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## 1. INTRODUCTION

Technology development has become a major topic in society in recent years. This rapid innovation in technology and digital trends has unknowingly changed the lifestyle in society, even becoming one of the important things in living and communicating daily. One of the most prominent trends is the emergence of artificial intelligence and technology that is heading towards all-digital (Arti, 2020) in the fields of health, finance, and education. These

digital technologies were created to support human activities to be more efficient and productive.

In addition, the Internet of Things (IoT) is also experiencing significant growth, with everyday activities connected to cyberspace (Rusnawati & Hariyati, 2022). This enables data collection and activities to be carried out in a remote control. This interconnected world is reshaping industries such as smart homes that can create more efficient systems and enable data-driven decision-making.

This certainly causes many sectors to be affected by the emergence of developments in the scope of technology. The rapid development of technology and information certainly has its impact on everyday life, including in the scope of higher education. The utilization of digital technology and information in the world of higher education has become increasingly widespread (Anshori, 2017). The emergence of various access to digital learning resources is expected to facilitate teaching and learning activities and enrich learning materials.

Academic Library is one of the institutions within the scope of higher education that is required to develop along with this industrial revolution. Learning resources and access to library services are things that need to be considered in the development of higher education libraries.

In this all-digital era, of course, a lot of information can be accessed online and information search activities in this Industry 4.0 era are also carried out by utilizing the internet network and several website systems. Libraries as a developing organism and now in an age of rapid technological development must certainly participate in making changes to continue to meet the information needs of their librarians (Diana, 2016; Enlevi & Masruri, 2023; Kuriawaty, 2017).

The development of libraries today has entered an all-digital trend. Until the concept of Digital Library emerged, it provided an opportunity for users to be able to access the library without coming directly to the library. Khan and Bhati (2015) stated that a digital library is a collection of information and digital services where the information is managed in digital form and can be easily accessed digitally (Surachman, 2014; Suharso, Arifiyana & Wasdiana, 2020).

Digital libraries, also known as virtual libraries, have emerged as a powerful trend that has taken center stage in the field of library and information science (Chu, 2010; Searing, & Offenstein, 2010). It is a modern and innovative approach to preserving, organizing, and providing access to diverse information and resources in digital format. Thus, as technology advances, digital libraries are likely to play an increasingly important role in education, research, and cultural heritage preservation (Iswanti, Marleni & Rizkyantha, 2021; Maesaroh, 2020; Nurhayati, 2018).

A digital library is a whole system that does not work alone. To be able to build a digital library, several components of this digital library must work together to create a solid system. Digital libraries utilize technology to make information retrieval more convenient and efficient, allowing users to search, access, and download materials from anywhere with an internet connection.

The presence of digital libraries in today's technology trends is because it is believed that libraries should not only be physically present but in a virtual version (Almagooshi, 2015; Martin-Gutierrez et al., 2017; Kumari, 2015). Therefore, libraries need to adapt and prepare themselves to face immersive technology in the form of a meta-world or metaverse.

Metaverse is a virtual space that can connect each user to connect, interact, socialize, and engage with the digital environment (Erdanto & Martadi, 2022). This metaverse is often facilitated through technologies such as augmented reality (AR) and virtual reality (VR). The metaverse itself is a concept that has gained popularity in the fields of technology, virtual reality, and gaming, and represents a vision of a shared, immersive, and persistent virtual reality space (Fauzan & Priowirjanto, 2023).

In this regard, libraries can certainly explore new and creative ways to integrate various technologies to form a digital library. One of them is the use of Augmented Reality and Virtual Reality which can be used to improve the user experience in accessing library services (Jamil, 2018), until finally, the term metaverse library appeared.

However, the concept of the metaverse juxtaposed with libraries may be considered important, it depends on how libraries can adapt and integrate with this digital world. The library's readiness for the development of the digital era that is starting to enter the virtual world is certainly a challenge in itself.

This is because when libraries enter the virtual world, they need to consider several things. Among them are issues related to digital access, privacy, security, and digital literacy. In addition, the extent to which libraries can integrate the metaverse concept will depend on factors such as available resources, user demand, and library mission and goals.

Therefore, to be able to prepare a library that can adapt to the development of digital technology, various initial preparations are needed, one of which can be known by the general public based on published research (Ridwan, et al., 2021). Various types of renewable research are needed that can provide solutions to the problems of technological and digital trends that occur within the scope of this library.

## **2. METHODS**

The research method used in this research is a Systematic Literature Review. This method is used concerning the purpose of the research conducted to review previous studies related to the metaverse library. Based on the results of the review, it is expected to know how the development of research on metaverse digital technology and trends in the scope of library and information science. In addition, it is also expected to know the impact of previous research that can help libraries adapt and develop themselves to face the development of the digital technology world.

The steps taken in this research include 1) Determining research objectives based on problems that occur related to library development in the era of digital technology; 2) Determining the title search keywords based on the research objectives, namely "Metaverse Library"; 3) Collecting data through a comprehensive search of research articles for the year periodical 2014-2023 using the Publish or Perish application on the SCOPUS, Google Scholar and Crossref databases; 4) Processing the data obtained using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) by filtering the titles of articles deemed appropriate; 5) Processing data using the VOSViewer application to filter the content of research articles based on abstracts to determine the relevance of research articles.

In addition, to find out the comparison of research developments related to technology and digital metaverse trends, researchers also searched for research articles that have been published from 2014 to 2023 containing elements of "metaverse" in the research title. The search was carried out in order to find out the trend comparison of metaverse research articles with the metaverse library.

## **3. RESULTS AND DISCUSSION**

The results of the analysis conducted on research articles related to the Metaverse Library in the SCOPUS database obtained 21 related articles while Google Scholar over the past ten years of research articles on Google Scholar that have titles with elements of the Metaverse Library during 2014 - 2023 only amounted to 26 articles. On the other hand, research results with article titles containing the word "Metaverse" in the same period show results of more than a thousand article titles (Harzing, 2023). This is one of the supporting data that research topics related to having titles related to the metaverse library are still very minimal when compared

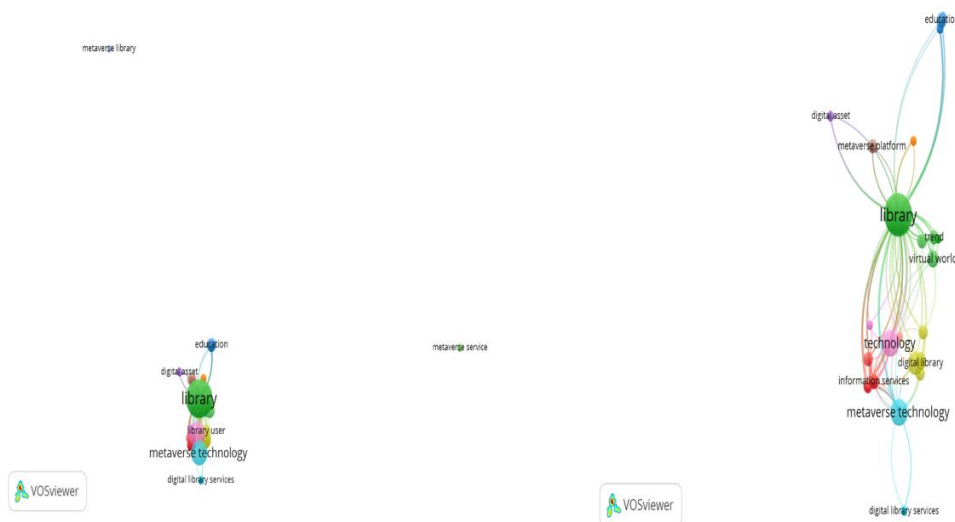




**Figure 2.** Results of Data Analysis of Words in the Title and Abstract of Articles with the Title Metaverse Library in the SCOPUS Database in 2014-2023

Based on the results of Figure 2, it can be seen that the articles with the title Metaverse Library that were successfully obtained in the Scopus Database in 2014-2023 have several keywords closely related to content topics, including keywords: Metaverse, Library, Metaverse Library, Virtual Reality, Digital Transformation, Library Services, Metaverse Academic Library, Literature, and so on. The furthest keyword that has no relation is the keyword Library Metaverse.

The results of the review using the VOSViewer application on the abstract and content of research articles collected from Google Scholar during 2014-2023 resulted in 420 keywords. The data was then re-selected based on relevance to 50 keywords, and Figure 3 presents the results of the keyword linkage analysis obtained.



**Figure 3.** Results of Data Analysis of Words in the Title and Abstract of Articles with the Title Metaverse Library in Google Scholar Database in 2014-2023

Based on the results of Figure 3, it can be seen that the articles with the title Metaverse Library that were successfully obtained in the Google Scholar Database in 2014-2023 have several keywords related to content topics. The main discussion in these articles is certainly related to the keywords Library and Metaverse. From these two keywords, several other keywords are closely related to the library and the metaverse, namely keywords: Library, Trend, Virtual World, Technology, Digital Library, Information Services, Metaverse Technology, Digital

Asset, Metaverse Platform, Digital Library Services and so on. While keywords that are not related to each other are the keywords metaverse library and metaverse service.

The metaverse is often described as a collective virtual space where multiple users can interact with each other and with digital objects in real time. The development of the metaverse requires advances in technologies such as virtual reality, augmented reality, blockchain, and artificial intelligence (Munawar, et al., 2022; Sulistianingsih, et al., 2023; Sutopo, 2022). Metaverse itself began to become popular with the support of technological developments and the widespread digital trend. This is evidenced by the number of studies related to the metaverse in the last ten years.

The existence of the metaverse in this digital era is important (Triningsih & Sudharno, 2023). This is because the metaverse can provide new dimensions of connectedness and interaction that can enable users to connect, socialize, work, and play in immersive digital spaces, answering the need for virtual engagement, especially in situations such as remote work, social restrictions, and global connectivity (Apridar, 2022; Labuem, 2022; Rachmadtullah, et al., 2022).

This advancement of technology that has become a digital trend can produce breakthroughs in the world of education, especially libraries. The existence of the Metaverse Library as a breakthrough can not only be an opportunity for libraries as a growing organism to be able to keep up with the times but can provide opportunities for users to gain more experience in accessing library resources (Fernandez, 2022; WangYebin, 2022).

The concept of metaverse library is a new concept related to digital libraries (Tella, et al., 2023). Through this concept, libraries can provide a new experience for users to be able to access information, resources, and library services using only the internet network.

On the other hand, the development of the metaverse library is related to the use of Augmented Reality (AR) and Virtual Reality (VR) in libraries which is a technology that has significant potential to enhance the library experience in various ways (Fitria, 2023; Ireton, et al., 2014). It is worth noting that the development and implementation of the metaverse library requires advances in AR, VR, and metaverse technologies.

Concerning the above discussion, it should be noted that the importance of the metaverse library will depend on the objectives and benefits to be achieved. To be able to implement a metaverse library, of course, some considerations are needed to know how important the existence of a library in the form of a metaverse is in today's digital era. Here are some things that can be taken into consideration for the importance of developing a metaverse library in this era of all-digital trends:

1. Immersive Learning; One of the functions of the library is as a means of learning resources and educational support, especially for college libraries which are certainly needed to be able to support lecture activities. With this metaverse library, users can get an interesting and interactive learning experience in the library.
2. Accessibility; Metaverse libraries can potentially provide opportunities for users to access information resources and services more easily. In higher education libraries, these resources can be accessed by civitas and even provide opportunities for non-civitas to use them.
3. Form of Innovation; The presence of digital technology trends encourages libraries to develop and innovate by presenting library resources by combining video game interactivity with library services
4. Information preservation: The metaverse library, which includes a digital library, it can play a role in the preservation of information for the long term.
5. Global collaboration; The metaverse library in higher education can provide opportunities for users to interact and collaborate with other users both within the scope

of the campus and abroad. With this metaverse library, users can form networks and exchange ideas through the same forum.

Through the development of digital technology trends in the form of the metaverse, university libraries can take advantage of this momentum to be able to develop their services. The emergence of this metaverse library can be utilized to provide Virtual Tour services, Interactive Learning, Digital Collections, and Virtual Reference Services for the procurement of events such as national or international conferences that can be attended without the need for face-to-face.

Therefore, these technological developments and evolving digital trends can be an opportunity for higher education libraries to thrive through this transformative force. As higher education libraries continue to evolve in the digital era, the ability to adapt, innovate, and meet the changing needs of their users will be key to their continued relevance and growth.

#### **4. CONCLUSION**

Metaverse is one of the emerging technologies and trends in this digital era. This is supported based on research results over the past ten years that show more than a thousand research articles. Libraries as a growing organism must be able to keep up with the flow of technology and trends that are developing. One of them is to form a digital library by utilizing augmented reality, virtual reality, and metaverse technology. However, based on the results of research, research related to the metaverse library has been carried out in the last ten years only reaching one-quarter of the number of articles related to the metaverse, which is only 25 articles. Therefore, it is expected that the library can continue to develop the concept of Metaverse Library with consideration as a form of innovation to improve immersive learning, accessibility, information preservation, and collaboration globally.

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