

# Metaverse



## Metaverse

*“A world where surgeons and engineers, even in the remotest areas, are able to access the most advanced training. Where digital twin technologies optimize low-emission industrial designs and repairs. Where healthcare is just one virtual appointment. Where education is one click away.” WIPO Director General Daren Tang*

### What is the Metaverse?

The term “Metaverse” was first introduced in Neal Stephenson’s cyberpunk novel, “Snow Crash” and the Metaverse has not quite made it from science fiction into reality yet.

 The Metaverse is still evolving, and its realization is a subject of ongoing development. It has the potential to revolutionize how we interact with technology and experience digital content.

The Metaverse is still in its early stages of development. Some believe that it represents a significant and transformative revolution in how we engage with technology and experience life. Others view it as an unremarkable extension of existing video game platforms or a concept that may never come to fruition.

Although there is currently no agreed definition of the Metaverse, most agree on some of its essential characteristics: an immersive 3D virtual space, interoperability, and real-time operation. Experiencing the Metaverse is predicted to allow a seamless switch between virtual, augmented, and physical worlds that will change how we work, play and live.

Whether one single Metaverse will emerge or a multitude of parallel Metaverses is part of a lively debate.



Another area for discussion is whether the Metaverse should lean towards centralization or decentralization. The key differentiation is the degree of control and ownership of content and virtual assets between the platform/Metaverse provider and the individual users. A decentralized Metaverse is community-oriented, has a decentralized approach to governance, uses cryptocurrency, non-fungible tokens (NFTs), smart contracts, and blockchain technology, and is operated and run by decentralized autonomous organizations (DAOs). Some examples of decentralized Metaverses are Decentraland, Sandbox, and Africarare, the first African Metaverse marketplace launched in 2021.

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### **Decentralized autonomous organizations (DAOs)**

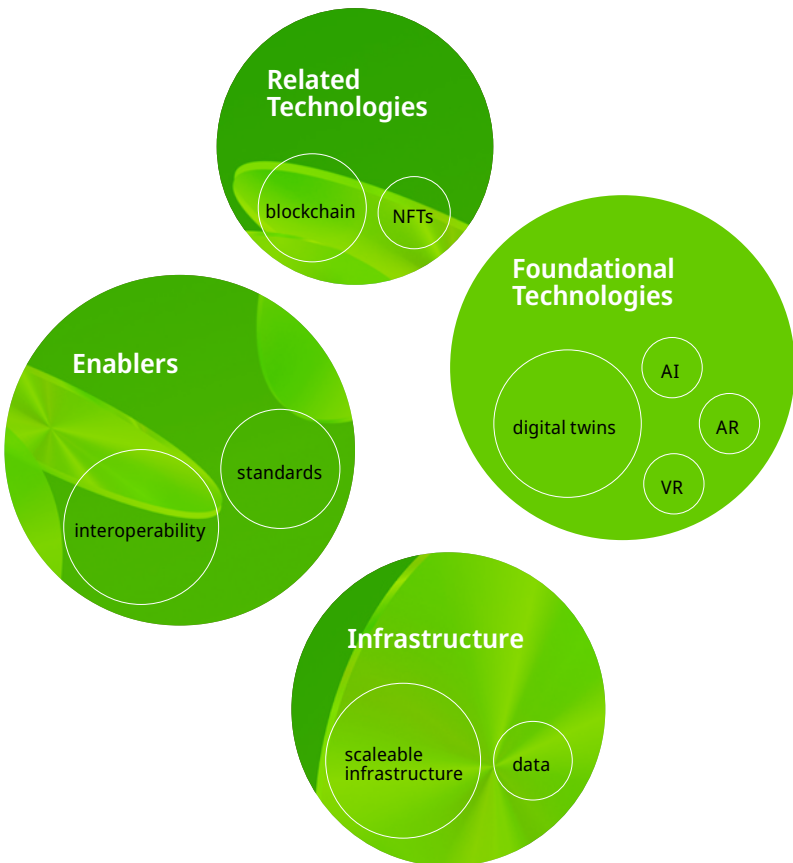
DAOs are blockchain-based community-built structures with no centralized leadership. Some 12,000 DAOs were registered in 2021. However, they remain vulnerable structures that are not recognized as legal entities and cannot enter into contracts with traditional entities, open bank accounts, or hold IP.

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## Components of the Metaverse

Many of the foundational technologies for the Metaverse are being developed, such as VR, AR, XR, and artificial intelligence (AI). However, for the Metaverse to reach its full potential and attract a wide range of content, there remains a need for ongoing technological advancements to enable true 3D experiences in VR, sensory interaction and haptic feedback, and user-friendly interfaces. These include high-speed networks, powerful servers, and cloud computing capabilities to handle the computational demands of the virtual environment.



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## What are VR, AR, and XR?

VR, AR, and XR are technologies that enhance our perception of reality through computer-generated information and are some of the important technologies to help users interact with the Metaverse.

Augmented reality (AR) overlays computer-generated information onto our view of the real world, enhancing our perception of the environment.

Virtual reality (VR) creates a fully immersive experience by replacing a user's view with a computer-generated virtual environment.

Extended Reality (XR) is a term that encompasses AR and VR. XR technologies blend the physical and digital worlds, overlaying computer text and graphics onto real-world or virtual environments.

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## Potential economic impact

The Metaverse market is worth more than USD 680 billion globally. It is estimated to become a USD 5 trillion market as soon as 2030.

The Metaverse has the potential to boost the videogame industry, already worth a hundred billion dollars, to global revenues of USD 360 billion by 2027. Some suggest that over 25 % of people will spend at least an hour a day in the Metaverse in just three years.

There are currently already 390,000 patent applications pending worldwide on core technologies such as VR, AR, and XR-related technologies, showing a remarkable investment trend. Metaverse terminals and wearable devices represent a promising electronic device market, with the top 20 applicants filing nearly 8,000 patent applications.



As well as representing a significant potential for economic growth, the metaverse has the potential to change the world.



## Challenges

The Metaverse has the potential to bring many benefits to society, in areas such as health, education and cultural preservation, but also raises many challenges and concerns.

Legal and ethical challenges include how to ensure inclusivity, security, privacy, safety, data protection, respect for intellectual property rights, and enforcement of IP rights, particularly for virtual goods, avatars, and digital items. Technical challenges include how to allow for interoperability and how to provide standards that are at the heart of the continuity of data and create an immersive, realistic, and fun virtual world.

Many voices are concerned about the potential concentration of power in platform ownership and operation. These voices highlight the possibility that certain entities or companies could gain significant control and dominance over aspects of the Metaverse, including data. This could lead to stifling competition and innovation and impact the diversity and inclusivity of the Metaverse.

 Policymakers should be aware of and keep a close eye on the challenges. While the Metaverse is still in its infancy, there is a window of opportunity to establish clear, fair, and transparent rules to shape an inclusive, safe Metaverse that benefits all.



# Key IP Considerations

## Overview

The Metaverse raises IP questions across the full breadth of IP rights, IP registration, and IP enforcement.

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### Copyright

In the Metaverse, copyright laws will still apply. However, the virtual nature of assets and content that are not confined to a jurisdiction introduces a significant level of legal uncertainty. Similarly, there are questions about how existing exceptions and limitations to copyright would apply. In the absence of clear rules, private contractual terms between platforms, content providers, and users may play a crucial role. Additionally, licensing content, and collecting royalties will introduce another layer of complexity when dealing with a multiverse of Metaverses.

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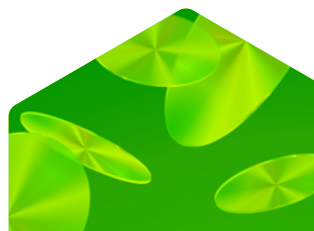
### Trademarks

The Metaverse poses questions for both the registration and enforcement of trademarks.

Trademarks are registered for goods and services and, typically, trademark registrations indicate the class or classes into which goods and services fall. A number of changes and new entries for NFTs and the Metaverse will enter into force on January 1, 2024, for the next version of the [Nice Classification](#) (NCL 12-2024).

Far from being theoretical, virtual marketplaces offering for example sneaker and designer handbag NFTs are becoming real business models. This is raising complex issues for brand protection and several trademark infringement litigation matters are ongoing globally. IP questions to consider include discussions about jurisdiction and applicable laws, non-commercial and fair use defenses, and the likelihood of confusion.

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### Design rights

Virtual designs such as graphical user interfaces (GUIs), icon designs, typeface designs, and three-dimensional designs will be key in shaping the Metaverse and are specifically created for virtual environments.

This raises questions about whether such virtual designs can be protected by design rights.

In some countries, protection for virtual designs is available, although it may be necessary to file design applications for the physical products that embody these designs. In those countries, virtual designs themselves cannot be filed without a connection to physical embodiments. Other countries have separated virtual designs from physical products.

Designers often file for protection for both virtual and physical designs to manage the legal uncertainties they face.



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### Patents

The back end of the Metaverse, which includes networked computer systems like distributed ledgers and blockchain, presents challenges for obtaining patents. Patenting in this area can be difficult, as it typically requires a demonstrable technical effect and software as such is usually excluded from protection. Moreover, while AI plays a central role in the Metaverse, inventions relating to AI methods or algorithms may not meet the criteria for patent eligibility and raise questions relating to their sufficient disclosure.



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### Traditional Knowledge

Virtual tourism and the replication and appropriation of landscapes, traditional crafts, characters, designs and languages that reflect cultural identity or significance are among the situations that raise concerns about the protection of the traditional knowledge (TK) and traditional cultural expressions (TCEs) of Indigenous Peoples. It is essential to ensure that Indigenous Peoples have both the opportunity to express and share their TK and TCEs in the Metaverse themselves and to control whether and how their TK and TCEs are used by others.

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When considering the options available for their IP ecosystems policymakers may want to consider the whole breadth of IP issues relevant to the Metaverse. While the Metaverse is still evolving, innovators and creators already face many uncertainties in the IP field and may require proactive guidance from IP Offices, such as trademark or patent examination guidelines.

## IP protection of digital twins

A digital twin is a virtual copy or simulation of a physical object, system, or process. It is created by integrating sensor data into computer simulations. Digital twins monitor, analyze, and enhance the performance of the corresponding real-world object or system and are also increasingly being used in engineering design.

Digital twins showcase that Metaverse technologies can be protected by a mesh of IP rights:

| Copyright                                            | Sui generis database rights | Patents                                                       | Trade secrets            |
|------------------------------------------------------|-----------------------------|---------------------------------------------------------------|--------------------------|
| software<br>(expression of<br>a computer<br>program) | input data                  | hardware                                                      | hardware                 |
|                                                      | output data                 | simulation<br>and models,<br>depending on<br>technical effect | simulation<br>and models |
|                                                      |                             | application                                                   | application              |





## Enforcing IP rights in Metaverse

As a fully virtual world with virtual assets and transactions, the Metaverse raises complex questions regarding applicable laws and the infringement/enforcement of IP rights, which by their nature are territorial rights.

The large amount of user-generated content, and the promise of the Metaverse to benefit creators and content makers more directly, complicate enforcement leading to potentially many more but lower-value disputes.

To avoid some of these uncertainties, online platforms are starting to create frameworks for dispute resolution in their terms and conditions. These often include license provisions for user-uploaded content to address copyright infringement concerns and dispute resolution mechanisms including procedures for notice and takedown. Smart contracts can also play a role in facilitating the enforcement of IP and fair royalty payments, providing additional security for IP owners.



The legal uncertainties concerning jurisdiction, applicable laws, and enforcement of IP rights are leading to online platforms creating contractual enforcement frameworks.

## Case studies

The video games industry is well-suited to leverage the potential of the Metaverse due to its extensive experience in handling virtual world challenges, fostering engagement, and building communities. Game developers possess valuable expertise in creating meaningful social interactions and providing enhanced life services within virtual environments but gaming platforms are generally not set up to be interoperable.

Many other industries are stepping into the Metaverse and new business models that are calling for more interoperability are emerging.

Examples of new forays into the Metaverse include digital financial solutions, education applications, virtual influencers, virtual designs, event platforms, and tourism. The breadth of new business models is also reflected in the diversity of IP challenges and questions.

## Application

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A one-stop decentralized platform to allow people to build their own community, socialize and have their own businesses

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A platform to organize Metaverse events in a secure and fully customizable way

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A virtual influencer and an interactive CGI character

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The digitization of heritage and cultural practices for display in the virtual world

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A Metaverse video game

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## IP Challenges/Questions

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How can IP rights and obligations be defined in decentralized systems like web3?  
How can IP rights and obligations be defined in the case of collaborative creation between users who have never met?  
What are the copyright considerations for the content uploaded and shared by users on the platform?  
What are the differences between licensing content in the Metaverse compared to the real world?

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What measures can be taken to ensure that no third-party IP rights are being infringed?  
How can the platform facilitate the creation and sale of digital assets or NFTs within events while addressing ownership and licensing concerns?  
Do IP rights attach to NFTs and do they transfer with the NFT in case of a sale?  
How can the platform ensure that it has the right to use musical works for Metaverse concerts?

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What measures can be taken to safeguard the IP rights of virtual influencers in the Metaverse?  
What is the process for registering trademarks for virtual goods?

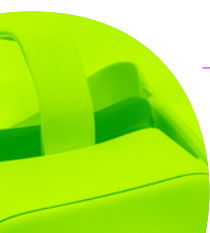
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Can IP protect history and cultural heritage, and can licenses to any such IP rights be granted?  
How can IP protect heritage to ensure the underlying people and populations benefit from their heritage in the virtual world?

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Are existing IP rights sufficient to protect innovations and creations in the virtual world?  
What steps can be taken to handle copyright and ownership of user-generated content within games in the Metaverse?

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## Further reading

The WIPO Conversation on IP and Frontier Technologies is a leading global forum to facilitate discussion and share knowledge among all stakeholders on the impact of frontier technologies, including AI, on IP.

The discussion in the seventh session of the WIPO Conversation focused on the IP and the Metaverse to help policymakers understand potential policy choices. More information about the [seventh session of the WIPO Conversation](#), including the program, presentations, and webcast, can be found on the meeting page.

More information about IP and frontier technologies is available on the WIPO website: [www.wipo.int/ai](http://www.wipo.int/ai).

## Next steps

To keep informed about the next session of the WIPO Conversation, sign up for the IP and Frontier Technologies Division's newsletter by sending an email to [frontier.tech@wipo.int](mailto:frontier.tech@wipo.int).

