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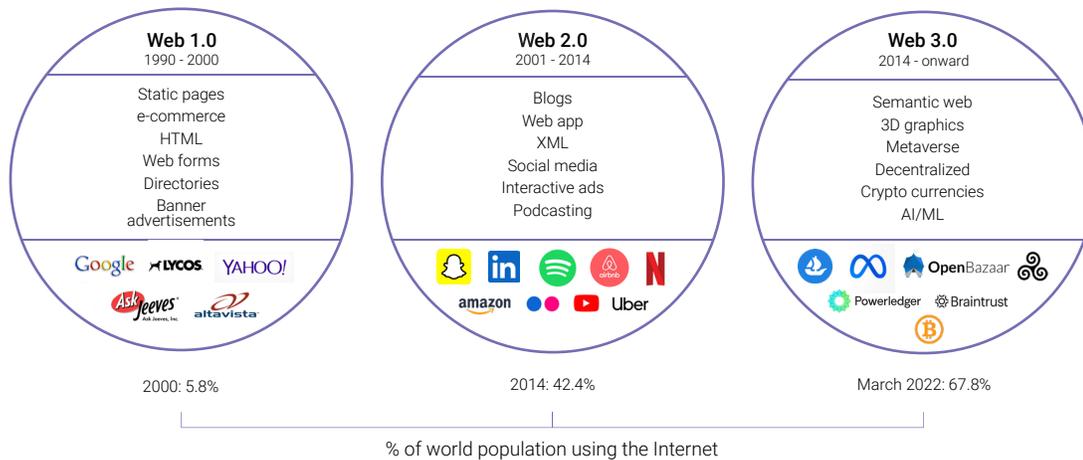
What is the IP Reality of the Virtual World?

By: Ajay Yadav

Everyone is tapping their feet to join the Metaverse dance by announcing new business visions, acquisitions, rebrandings and much more. However, is their IP strategy on track?

When I was born, the Internet was nothing; when I was in school, the Internet was something; and today the Internet is everything! I remember when I first got my hands on the Internet, I was amazed by the immensity and import of having so much information all in one place and being able to access it with such ease. After that, the Internet grew exponentially and so did the experience for me, and I believe for a lot of people on the planet. Most recently, the Internet's experience has become even sweeter with handheld/portable devices opening new forms of user experience at our fingertips, such as video calls with friends, social networking, video streaming, online shopping, gaming, Health, banking/payment, etc. Moreover, during the Covid-19 pandemic, I believe the Internet showed us its real power by making us believe – yes, it is possible to effectively collaborate, attend meetings from home, engage in remote education, manage health consultation, receive contactless deliveries and experience big data, and AI for predictive modeling and much more. All this has happened because the evolution of technologies and the Internet brought us new and improved experiences.

Is the Internet evolution continuing?



In the last three decades, we have seen exponential growth in the technologies supporting the different generations of World Wide Web and global Internet users. The evolution started with Web 1.0 which only gave us information; Web 2.0 where users contributed the content; and now Web 3.0+ which offers a more personalized, interactive, and immersive user experience. This evolution has only been possible because of the vision to improve the internet experience. To continue this evolution companies have invested millions and billions to build

innovative technologies that can enhance the experience-quotient of the user. Taking this evolution to the next level and to re-define the experience-quotient of the user, companies are now investing and working aggressively toward the next generation of the Internet experience – the Metaverse, what many believe is the new “Eureka!” moment for the next generation Internet experience.

What is the Metaverse?

The term Metaverse was coined by Hugo award winner, American fiction writer - Neal Stephenson in his book “Snow Crash” published in 1992. The following excerpt from his novel offers us a glimpse into what Metaverse might look like:

“So, Hiro’s not actually here at all. He’s in a computer-generated universe that his computer is drawing onto his goggles and pumping into his earphones. In the lingo, this imaginary place is known as the Metaverse. Hiro spends a lot of time in the Metaverse.....”

In simple words, the Metaverse is a hyper-realistic, real-time 3D environment where you, via your avatar, can interact and experience the virtual immersive environment. Imagine a parallel digital world, where you can enter to meet friends, attend concerts and client meetings, buy/sell things and run a business, much like what you do in the physical world. The only difference from the physical world is that the Metaverse will be “decentralized.” What does decentralized mean? Let me explain.

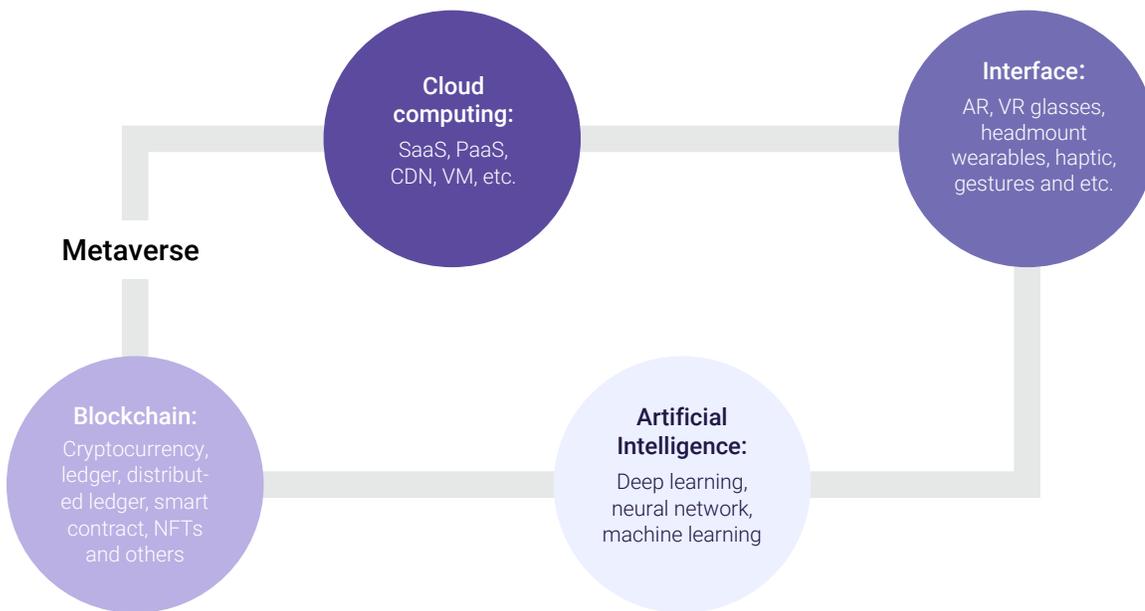
Most of us have played video games in some form or fashion whether it’s on a phone, desktop, or gaming console. While playing a game, when we achieve a target or reach the next level, we get rewarded with some points, coins, or other accolades. How do we redeem those rewards? We save a life, get a booster, buy accessories, and much more. So, reward redemption is dependent on the game company’s rules; we can do only what they want us to do. Therefore, it is centralized. In the Metaverse, anything you earn, buy, or possess will be owned by you and you only. You will decide where and how you want to spend your time and money. Decentralized is when a single entity cannot block you from doing what you want to do with your assets/belongings.

To lead the race of the Metaverse adaption and make the business future-ready, companies are shelling out big. For example, Facebook recently rebranded and renamed itself Meta Platforms, Inc. with its focus and vision on the Metaverse. Furthermore, Microsoft, Nvidia, Intel, Alibaba, Walmart, McDonalds, JPMorgan, Tencent, ByteDance, and Nike are a few of many names who are working aggressively toward technologies and applications that will contribute to build the Metaverse ecosystem. Based on a recent report published by [re-searchandmarkets](https://www.searchandmarkets.com), the Global Metaverse market is expected to reach a whopping US\$758.6 Billion by the year 2026 at a 37.1% CAGR. Such growth projection is only possible when there is length of innovation and breadth of commercialization from the companies.

What technologies will contribute to the Metaverse ecosystem?

The Metaverse will require an array of providers and technologies to live up to its promise, which is why it will open a wide door of innovation opportunities and possibility to secure IP. Below are a few major technologies that will lay the foundation of the Metaverse implementation and the different players that will attempt to secure IP for their innovations.

Figure 1. Major technologies in the Metaverse



Microsoft and Meta Inc., leading the Metaverse IP race?

We all have heard about Facebook’s rebranding, its \$10 billion dollar investment in Metaverse and Microsoft’s biggest acquisition of Activision Blizzard for \$68.7 billion. However, can these be indicators of current and future IP leaders in Metaverse? There is no objective answer to this. Investments are a good starting point to reach relevant IP via R&D or inorganically acquire IP. So how do we understand who is leading the Metaverse IP wagon? In the next section of this whitepaper, I will try to answer this question by applying a quantitative approach to individual Metaverse elements:

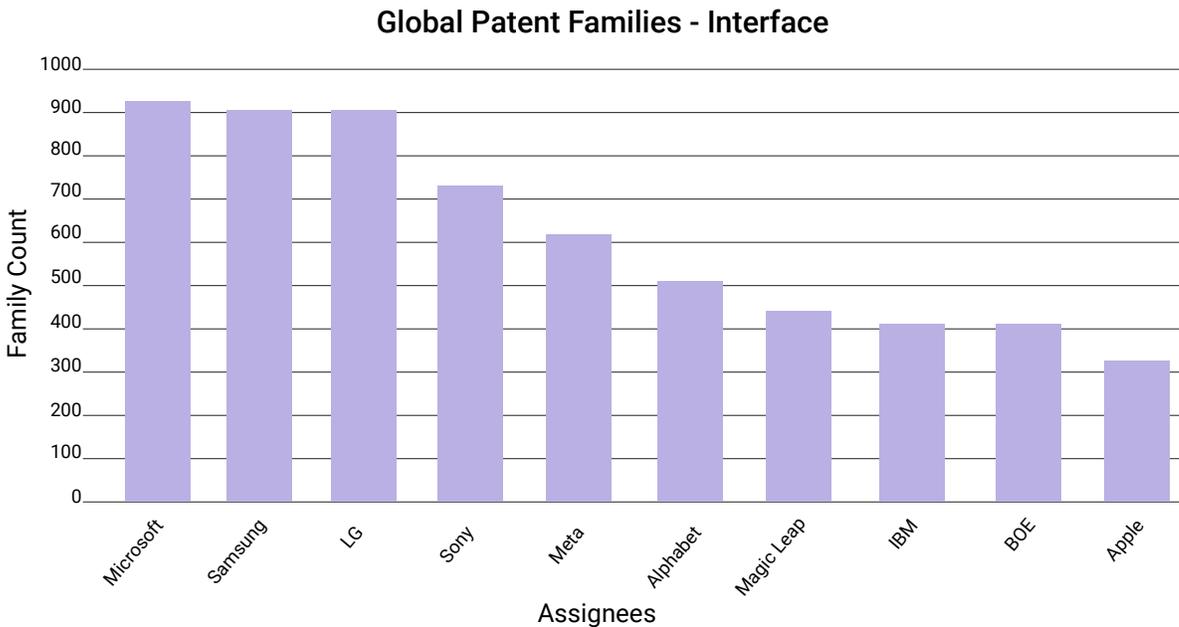
1. Interface

This includes wearables that can generate an interface between the physical and virtual worlds. The wearables can be in any form - 1. Augmented Reality (AR)/Virtual Reality (VR) headsets that will make you feel that you are in the virtual world, for example, [Oculus Quest](#). 2. A glove that reproduces sensations to make you believe that you are grasping an object or feeling friction when moving the palm on a rough surface in a virtual world, for example, [HaptX Gloves DK2](#) 3. An entire bodysuit to simulate an experience, and provide haptic feedback to the body, such as [Teslasuit](#).

All these forms of Interfaces for the Metaverse rely on technologies like AR, VR, Mixed Reality (MR), Haptic response, Gestures, and Optical systems. Companies have been innovating and publishing papers for a long time in these technologies. For VR, it goes back as early as the 1950s. Sensorama is one of the earliest known examples to offer an immersive experience using VR technology protected by U.S. patent [US3050870](#).

Following is how the current innovation trends look like for the “interface” technologies:

Figure 2. Major innovators in Interface technologies

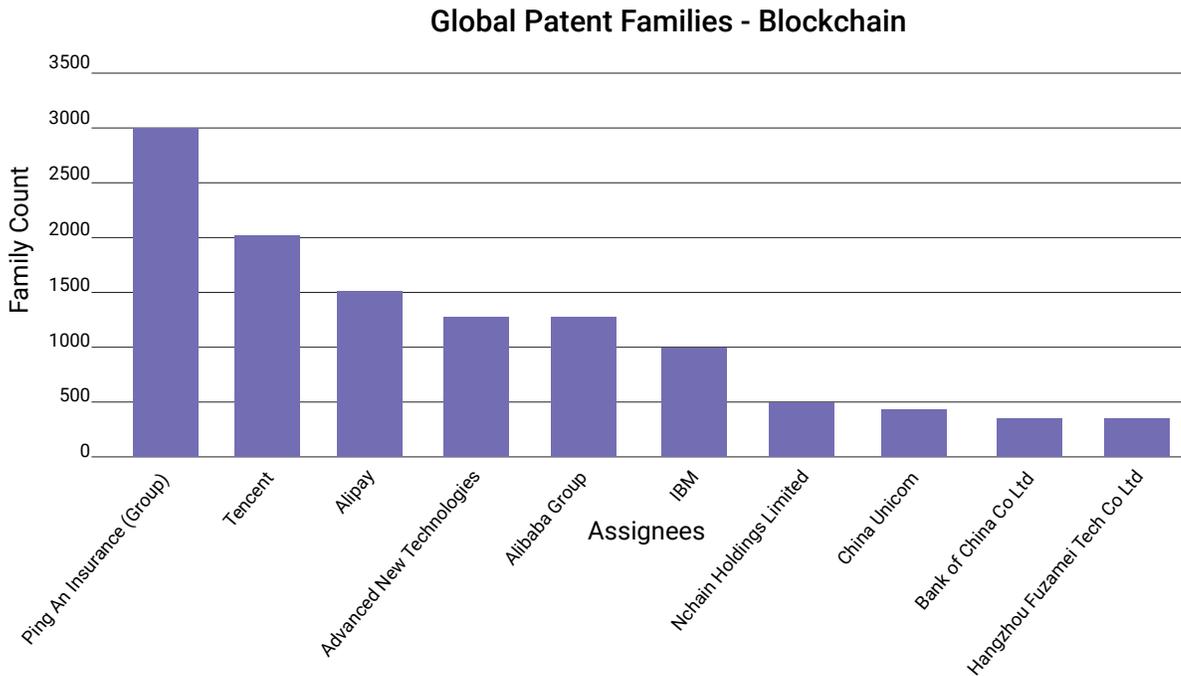


The real boom in patent filing activities in these technologies took off in 2014, when various companies started to focus on providing more real and engaging experiences to customers via mobile, video games, and others. Where Microsoft, Samsung, and LG together stand strong compared to the rest of the players in the domain. Furthermore, Magic Leap, Meta, and Apple stood out by filing more than 40% of their patent applications related to interface technologies in the last four years (2017-2020). Moreover, Samsung, Sony, and Alphabet have been consistent in securing IP for Interface technologies. Interestingly, Goertek (positioned in top 11-20 innovators) has a good arsenal of IP in the Interface technologies. Goertek is a China-based public company that offers a growing range of VR products and plans to increase its production to five million units per year. Goertek is also a supplier to the top patent filers in this domain - Apple, Samsung, and Sony. Furthermore, some news suggests Goertek is expected to mass-produce Meta Cambria and Sony PS VR 2. Looking at trends and business activities, the Metaverse will certainly act as a catalyst for innovations in this category.

2. Blockchain

For me, Blockchain is the heart of the Metaverse. Blockchain has been one of the fastest growing technologies in the past few years and laid down successful initial implementation in different forms. Blockchain-based offerings will play a fundamental role in building the Metaverse, for example Cryptocurrencies, non-fungible token (NFT), build new digital assets, establish digital ownership, decentralization, interoperability and much more. Why only Blockchain? It is because Blockchain enables users and business owners to secure their digital assets in virtual environments (the Metaverse). Looking at the trends, Blockchain has been welcomed by all the industries and innovations have been picked up by all type of players – Corporates, Financial institutes, Start-ups and universities.

Figure 3. Major innovators in Blockchain



If compared, China is innovating at double the pace of the United States when it comes to securing IP for blockchain-related technologies. This is evident when nine out of the top 10 global innovators are based in China. Also in the last year, over 1,000 China based companies filed 10,000+ Metaverse-related trademarks showing a strong approach toward the Metaverse in China. In the United States – leading innovators are IBM, Intel, Mastercard, and Visa.

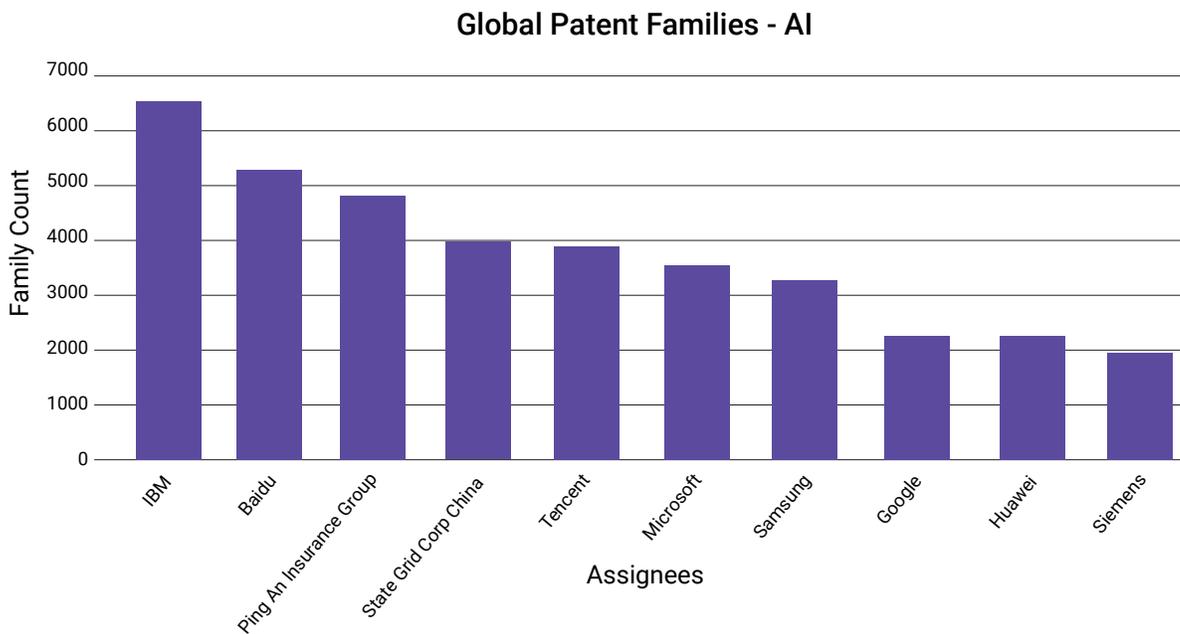
Publications related to blockchain trackback to the 1990s, when scientists Stuart Haber and Scott Stornetta published their [papers](#). However, patent filing activities rose from 2015 onwards when companies started realizing the potential, the versatility of the technology, and of course the success of Bitcoin. China based Ping An Insurance group with its subsidiaries stands top in terms of having the highest number of patent families, with a primary focus on China jurisdiction. Ping An is one of the largest Insurance companies in the world that drastically increased its filing in blockchain technologies in 2019, indicating its future business focus on using blockchain. Interestingly, Ping An also started filing patents in AR/VR domain that might be indicative of their Metaverse plan.

Furthermore, start-ups like Nchain; and private company Hangzhou Fuzmaei Tech. Ltd. increased their filing from 2017 to secure their position in the top 10 innovators in blockchain technologies. Other companies trailing the top 10 innovators in Blockchain include Intel, Bizmodeline, Microsoft, and Baidu. These initial innovations from start-ups and other small actors will play a key role in the Metaverse as the filed patents cover basics of Blockchain.

3. Artificial Intelligence

Artificial Intelligence (AI) and Machine Learning (ML) are going to play a significant role in building the Metaverse. There will be many metaverses offered by different providers. Eventually we expect interoperability to enable users to experience the Metaverse running 24/7, where the scale of content, fresh content feed, personalized content, and other digital experiences would require a humongous effort. To make this more efficient and accurate, AI would play a pivotal role. Companies have been innovating in AI/ML for the past few years and the Metaverse will certainly open new opportunities for innovations to realize the project Metaverse.

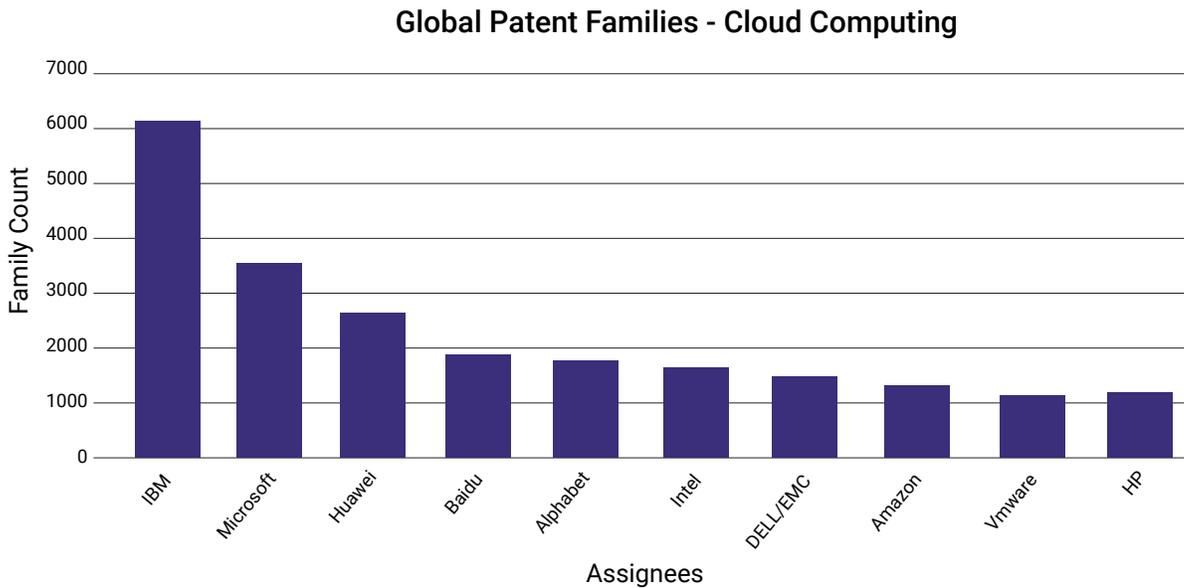
Figure 4. Major innovators in AI



4. Cloud computing

An always running Metaverse would require an enormous amount of storage, processing, and performance. To keep everything up, cloud computing is the only cost-efficient option the Metaverse creators would have. Knowing the scale of processing required, innovations in cloud computing will be very critical for the Metaverse to exist.

Figure 5. Major innovators in Cloud Computing



With the evolution of Fog/edge computing, innovations have mushroomed around cloud computing-related technologies. IBM has been proactive in securing patents for cloud computing technologies followed by Microsoft, which is actively working toward Metaverse-based applications. Further, Huawei does have a strong IP and commercial offering under cloud computing. However, it may suffer commercially in the United States due to government sanctions. Other leaders in cloud computing – Baidu, Alphabet, Intel, Dell, Amazon, VMware, and HP would play an important role in offering an always-on cloud to the Metaverse application enablers.

Who will dominate the Metaverse IP?

Now we have seen which players own most IP in different Metaverse elements; however, does that indicate anything about who leads the overall race currently? The Metaverse is still in its infancy but is expected to grow big with a series of investments and innovations in different technologies put together. These innovations will be coming from different entities—large-mid-small companies, start-ups, Fintech companies, EdTech, and more. We have seen who is leading the IP race of individual Metaverse technology elements. However, to see the bigger picture of Metaverse IP, it would be wise to combine the individual IP story of the four Metaverse elements we discussed above as follows:

Figure 6. Matrix showing overall IP leaders in the Metaverse based on contributing technologies



In the above matrix, there will be some patent overlap across each technical category. However, looking at the current state - IBM, Microsoft, Tencent, and Alphabet own most IP for Metaverse's technology element. Furthermore, if we look at the current active and growing ecosystem for the Metaverse along with the above IP stats, I think Microsoft and Tencent have an edge over others commercially. Microsoft's already-available infrastructure - Mesh, HoloLens, Azure IoT, Azure Digital Twin, and Azure AI gives them first-mover advantage. Moreover, Microsoft's acquisition of Activision Blizzard gives them another edge to become a leader in the Metaverse, as I believe the gaming industry will be the first to offer true Metaverse. Similarly, Tencent, with its gaming dominancy, also has a huge user base through gaming, Wechat, QQ, and their social network, giving them a solid base to offer an immersive experience to a large user base and lead China's Metaverse plan.

Other leaders in the above tally have also started exploring the Metaverse plan in their own way, where Apple, Alphabet, and Meta are focusing on the technology and affordability of VR/AR headsets for the masses. Baidu launched a Metaverse mobile application "Xirang" allowing users to create avatars and chat with other participants. Samsung launched its flagship mobile phone Galaxy S22 in Samsung's Decentraland Metaverse. LG is partnering with companies to build Metaverse-enabling technologies. Sony Invested in Epic games to help them build the Metaverse. All the companies, irrespective of their IP strength, are aggressively looking for avenues to secure their Metaverse plans through partnership, innovation, product launch, investment, filing trademarks, and more. In addition, potential start-ups and small players working on Metaverse technologies will see acquisition attempts by large players.

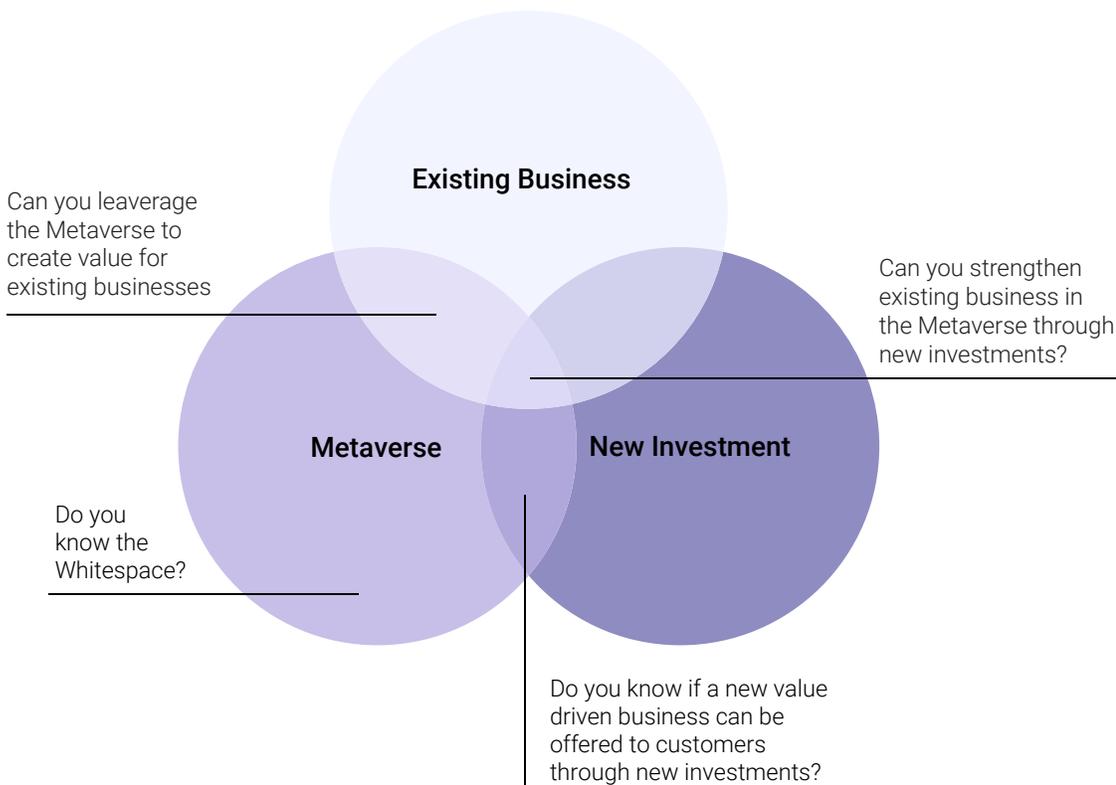
What does the future look like for the Metaverse?

The Metaverse is still a concept that needs the continuous steam of innovation despite existing players leading the IP race for the Metaverse's technology elements. More breakthrough innovations are required that can make Metaverse-enabling products/technology affordable, especially hardware such as AR/VR headsets, Haptic wearables, etc. I believe some serious Metaverse applications/ implementations are still six to eight years away, where applications in Gaming, Fashion, and Digital communication will be the flag-bearer of the Metaverse followed by others. The Metaverse will make the world small and accessible, and I believe it will add efficiency to physical world scenarios that we experience at home, work, social, etc. For me, an Ideal Metaverse will be a 24/7 running, interoperable, real-time, truly decentralized, secure, scalable, and lag-free immersive experience. There is no doubt that the Metaverse will bring exciting possibilities and opportunities to different Industries and businesses. Hence, securing IP will be key for companies to take their Metaverse dream forward. In the past year, we have seen small, medium, and big companies announcing their plans to get into the Metaverse. However, not many companies have aligned their IP strategy with their business strategy. In this race to adapt the Metaverse, the IP strategy might get ignored.

How should you plan your IP for the Metaverse?

Primarily, you should think about what your company's strengths are to assess if you should move toward Metaverse and evaluate the potential impact of the Metaverse on your business, product offerings and customers in a virtual environment. The below diagram poses some relevant questions for such assessments.

Figure 7. Relevant questions for planning the Metaverse solution for the business



Finding answers to the questions in the above diagram is not simple; the questions are complex and subjective. At this initial stage of the Metaverse evolution, it is important to get clarity on the following:

1. **Value Assessment for business:** Understand what value you will create by offering Metaverse-based applications/products.
2. **IP strategy:** Companies should not run to secure everything they innovate around the Metaverse. Innovators should be conscious while filing patents and should consider the following:
 - a. Do the due diligence before deciding to file a patent. As the Metaverse evolves, it will offer an ocean of opportunities to secure IP. However, filing patent for every innovation will result in more liability than opportunity.
 - b. Screen your portfolio to locate potential patents for which a continuation application can be filed to cover relevant Metaverse embodiment. Not all innovations need to come out of R&D.
 - c. Understand the landscape and identify the whitespace relevant for your business to strategize R&D investment and build the portfolio accordingly.
 - d. Look for potential partners to accelerate the Metaverse application development.
 - e. Be particularly vigilant if you are a start-up about securing IP for your unique business offering around the Metaverse. It will help you establish your business strongly as a first mover in the space. Further, Start-ups and SME should try experimenting more with their Metaverse business offering to come up with new potential Metaverse implementation/applications, as the Metaverse will take couple more years to grip a larger consumer.

At UnitedLex, we help our clients – large, medium, small and start-ups to make strategic moves into new technology by providing actionable insights and defining the IP strategy that can bring an advantage over the competitor. Also, we help our clients build smarter patent portfolios that enable them to both defend current portfolios and suggest proactive licensing opportunities for monetization. To learn more about the Metaverse and its IP strategies, [book a meeting here](#) with our experts.



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