

# The Financial Perspective of The Metaverse Industry in the Upcoming Decade

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**Abstract:** Metaverse, as the hot topic appeared recently, has been treated as the next golden concept after the internet. However, many people still keep in doubt about it since they are not very familiar with it and don't have much of a positive concept. Therefore, it's necessary to let people know about this industry thoroughly. This paper will focus on the Metaverse industry analysis, covering several leading companies within Metaverse's industry of 5G, Web3.0, VR, AR, and blockchain.

## 1. Introduction:

What is a metaverse? The metaverse is a massively scalable, persistent network of interconnected virtual worlds focused on real-time interaction where people can work, socially interact, transact, play and even create. [1] It uses advanced virtualization and technologies (AR, VR, Haptic Sensors, etc.) to fully immerse the user into the virtual world, including their sensory experience. Compared with the 2D dimensional internet era in which all the interacting elements are mostly designed by the software engineer, Artificial Intelligence (AI) would be in the position to interact with the users. In this paper, we will analyze the future prospects of the metaverse industry. We will first use some data from some head companies to claim the necessity of the metaverse under the current stagnation of the field of the internet, and then we will discuss what these head internet companies had done to prepare for the upcoming "metaverse" era to see how seriously the market values the metaverse. At last, we would talk about our own idea about what the metaverse industry requires right now to fully develop.

## 2. The necessity of metaverse

### 2.1 The overview of the internet field

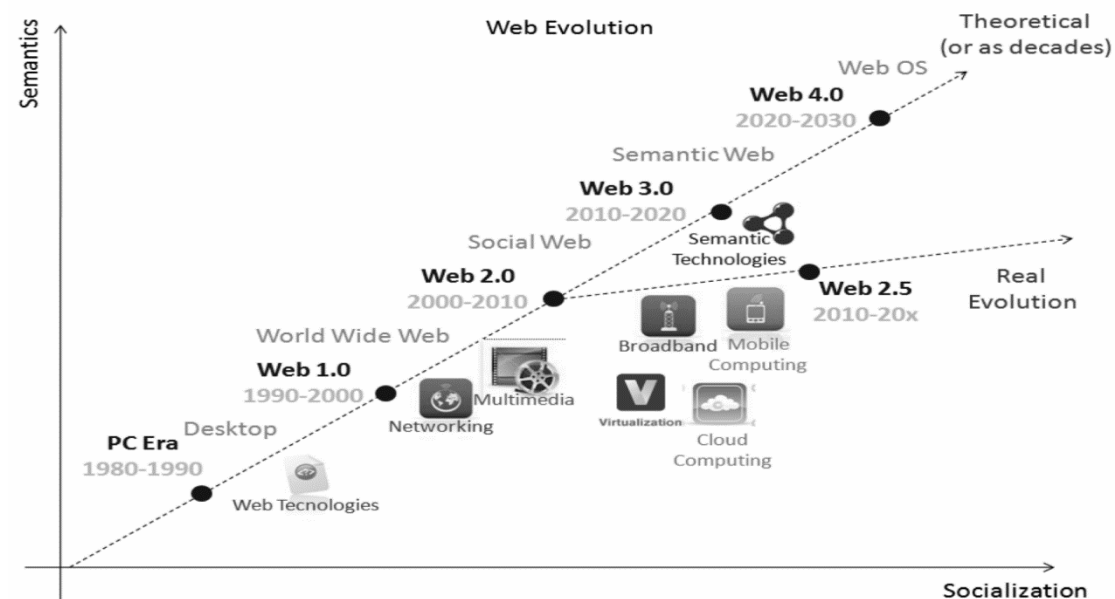


Figure 1. Eras of Web

Figure 1 here clearly draws a picture of the development of the internet. [2] Web1.0 is under the era of 1900- 2000, aimed to take information on the internet such as text, so it's also called the read-only web. The user on the internet could only read the content. Web2.0 is also called a read-write web. There is more interaction between users, and the internet started from Web2.0 gradually built by users instead of a single developer. Right now, Web 3.0 is also named read-write-execute web. A user on the internet can create their own rules for their virtual environment, and we also introduce machine learning and artificial intelligence to interact and interpret human behavior. Now we are standing in the position of Web2.0 and trying to move forward to the new era of Web3.0.



Figure 2. Metaverse Industry Map

Figure 2 covers different market niches within the metaverse industry chain, including experience, Discovery, Creator Economy, Spatial computing, Decentralized, Human interface, and infrastructure.[3]

## 2.2 The Stagnation of the field of the Internet

The main bottleneck of the current Internet industry is the involution platform form. Long-term lack of breakthroughs in content carriers, dissemination methods, interaction methods, participation, and interactivity, resulting in "growth without development". Here we collect some revenue data from some large internet companies and put it into our model to calculate the growth rate[4].

(1) We use the revenue of the current year to minus the revenue of one last year and then divide it by the revenue of the past year. Then we have the growth rate, as shown in Table 1.

Table 1 The growth rate of past years

| Unit /In millions | 2018 Actual     | 2019 Actual     | 2020 Actual     | 2021 Actual     |
|-------------------|-----------------|-----------------|-----------------|-----------------|
| Nvidia            | US\$9,714.000   | US\$11,716.000  | US\$10,918.000  | US\$16,675.000  |
| Unity             | US\$380.000     | US\$541.779     | US\$772.445     | US\$1,110.526   |
| Microsoft         | US\$89,950.000  | US\$110,360.000 | US\$125,843.000 | US\$143,015.000 |
| Meta              | US\$40,653.000  | US\$55,838.000  | US\$70,697.000  | US\$85,965.000  |
| Google            | US\$110,855.000 | US\$136,819.000 | US\$161,857.000 | US\$182,527.000 |

$$\sum_0^{\alpha} [\overline{Rev}_1 - \overline{Rev}_0] / [\overline{Rev}_0 * N^2] \quad (1)$$

Increment rate of Internet Industry

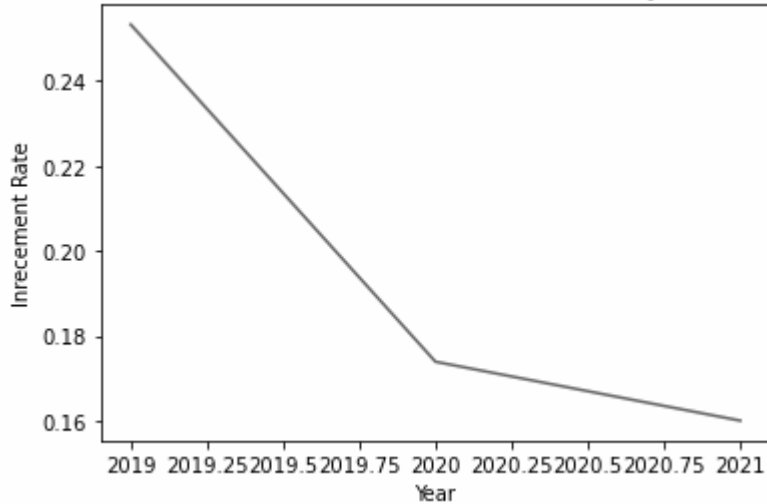


Figure 3. The growth rate from 2019 to 2021

Here is the data from the year 2018 to the year 2021, we discover the revenue trend within the internet industry is keep increasing, with the fact that their increment rate is decreasing. The reason for this situation could be analyzed from three aspects: market space, the content, and the policy, as shown in Figure 3. Let's take China as an example.

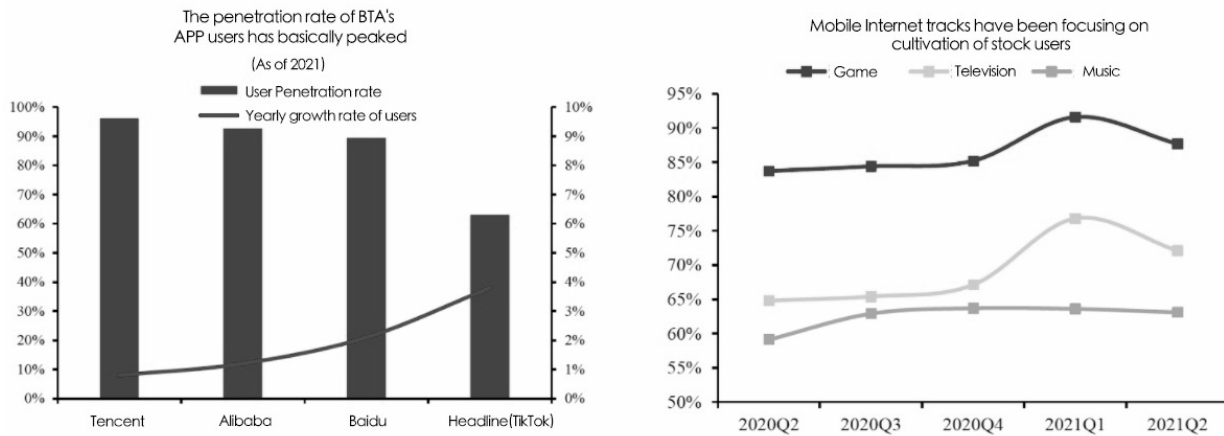


Figure 4. BTA penetration

Until June 2021, the number of internet users had reached 1.011billions of people, and the internet penetration had reached 71.6 percent.[5] Meanwhile, the number of mobile phone users has reached 1.007 billion people, the percentage of people who use phones to surf the internet is 99.6%, which is a quite large amount of people. These statistics show that the number of internet users had almost reached the barrier and the growth rate of internet users couldn't be much more than that. Also, until 2021Q2, the BAT penetration rate is over 80%[6], which shows that all the huge internet companies have tried their best to let users get familiar with their products and made a large success, as shown in Figure 4.

Also, at the beginning of the end of 2020, the huge trend of antitrust had raised. For instance, on Oct.10, 2020, the US Department of Justice proposed an antitrust lawsuit against google because google had the intention to impede fair competition in the commercial area. In 2021H1, the European Union started antitrust research on these giant internet companies, like Google, Apple, Facebook, and

Amazon. All of these companies had been punished in their traditional field, which forces these companies to find a new increment point. That's why these companies put lots of effort into the metaverse.

### 2.3 What did these Internet companies prepare for metaverse?

Facing an unprecedented crisis, these internet giants are trying to solve this problem by preparing for the metaverse era so that there would be a new platform to attract and store the data of the new users. Here is the timeline of some preparations of many internet companies.

Microsoft: "The essence of the metaverse is video game", as shown in Figure 5.

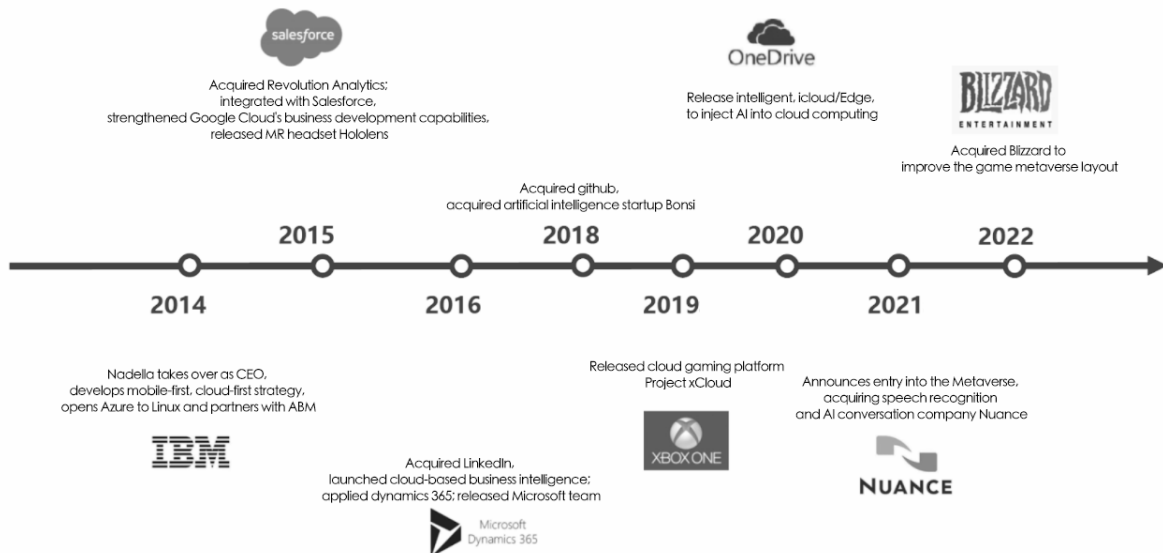


Figure 5. The timeline of big strategies of Microsoft [7]

Meta: The pioneer of the metaverse industry, as shown in Figure 6.

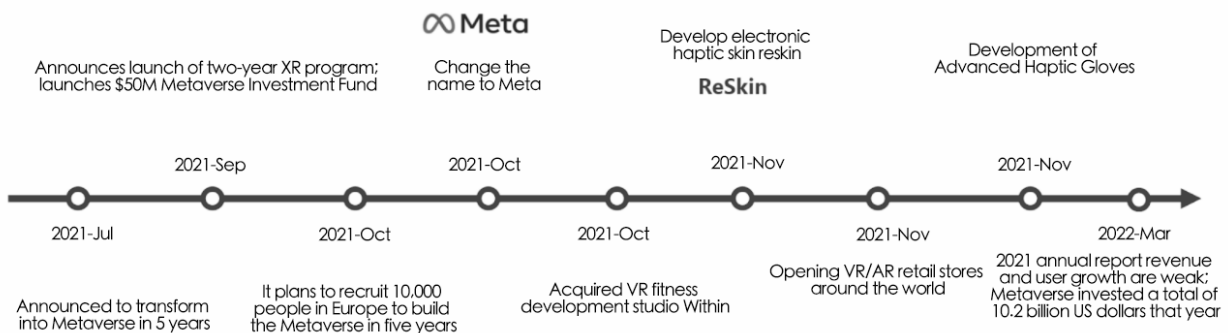


Figure 6. The timeline of big strategies of Meta[7]

Meta is very ambitious in entering the metaverse industry. For the hardware part, Meta had already bought the VR company Oculus, and published 6 VR hardware products so far, including OculusDK1 and OculusQuest2. Such measures made Meta successfully step into the VR consumer market. Also, Meta pays great attention to the content that is presented on VR, investing the VR developers, video content producers, and so on. For instance, their invested VR music game BeatSaber had already earned over 100 million dollars in revenue on the Oculus platform. Also, their VR shooting game Population: one is one of the highest rating games on the Oculus. In addition, at the 2021 connect conference, Meta showed the PresencePlatform that contains AI functions, including InsightSDK, VoiceSDK, InteractionSDK, which would construct a more realistic mixed reality for users. It's not hard to see that Meta is trying to be the leading company in the upcoming metaverse industry.

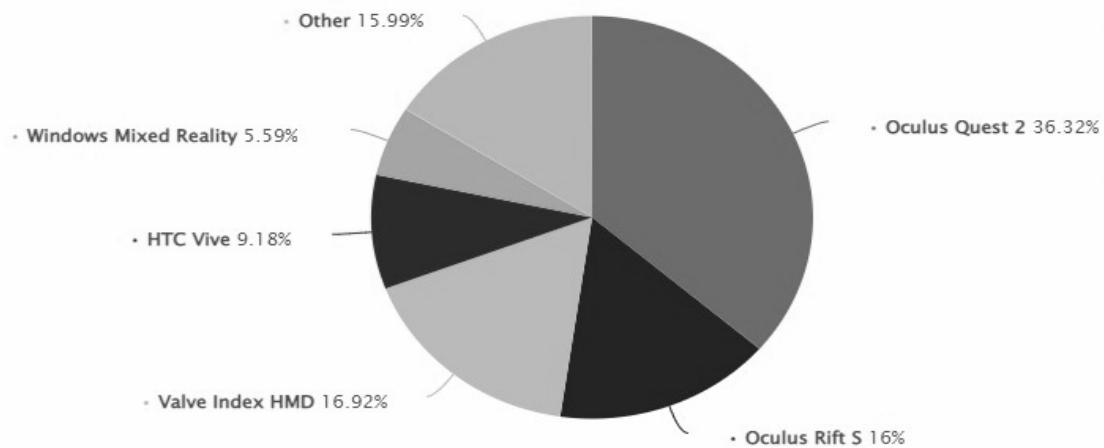


Figure 7. Oculus market share in VR in 2021[9]

Nvidia: The basic technical support of the metaverse, as shown in Figure 7.

Nvidia has obvious advantages in the GPU field. The AI, cloud computing, and other technologies involved in the Metaverse are inseparable from the support of the underlying GPU. According to JPR statistics, as of 2021Q3, NVIDIA has occupied 20% of the global PC GPU market share, second only to Intel's 62%. [8] In the PC dGPU segment, Nvidia has an 83% market share. In addition to GPUs, NVIDIA further extends its technology to data centers, high-performance computing, AI, and more. There are layouts in the underlying architecture, hardware side, and artificial intelligence software side. In particular, they are the pioneers of the AI field and started to do research in the AI area in 2010. With the upcoming era of computing power, all of the industries, like robots, auto-driving, and the metaverse, require the support of AI.

## 2.4 Benefits of Metaverse to citizens.

Despite the benefits that metaverse could bring to the internet industry, what benefits could normal people receive from the development of metaverse?

### Create new jobs:

5G infrastructure and the development of upstream and downstream industry chains have spawned many new jobs, such as 5G wireless network optimization engineers, 5G test engineers, and 5G information security engineers

### Increase social and economic benefits:

According to the estimation of China Academy of Information and Communications Technology, the revenue from 5G production, directly and indirectly, would be 6.3 trillion RMB and 10.6 trillion RMB.

### Optimize post structure:

5G technology facilitates the development of Artificial Intelligence, automatic industry, replacing the repetitional and process works.

### Improve the quality of employment:

For the difficulty of recruiting workers in traditional factories, 5G, industrial Internet, and other technologies can be used to improve the level of industrial automation and intelligence, and increase the added value of labor while improving employment.

Metaverse is a fancy concept but needs technology to explode in its upstream and downstream industry chains to turn into reality.

For upstream, metaverse will create great technician demands in infrastructure development such as VR, AR, semiconductor, Saas cloud companies. For now, we have AWS, Azure, Nvidia, Google Cloud, IBM, Intel, Panasonic, Verizon, AGORA, Skyworks, etc to provide such services. Since many of them are playing a major role in Internet fields, they need to solve the problem of decreasing increment rate. Metaverse products and outbreaks will build a new era in the Internet world solving

the problems with limited new consumers and low employment. When giant companies are looking for a new solution, governments are looking for new solutions, consumers are looking for a new way to go, metaverse would be inevitable. The development of metaverse industries would hugely benefit the production of society. When 5G industries promote the overall economic production by 30%, building more high-tech products will be a trend to promote more economic production, which metaverse takes place. Therefore, the metaverse will have a bright future. However, we need to take time and technology limitations into consideration.

It is good news for an immature metaverse industry: Immature industries have more ways to develop and merge more opportunities in both sellers and buyers. We have a higher demand for employees and research people, which will create more man-made demand for our customers. This is a positive circle until fully developed in the metaverse industry. When the metaverse concept starts to promote both upstream and downstream companies, we will turn it into reality, similar to the history of the internet.

## 2.5 The essence of technological support for the future development of Metaverse

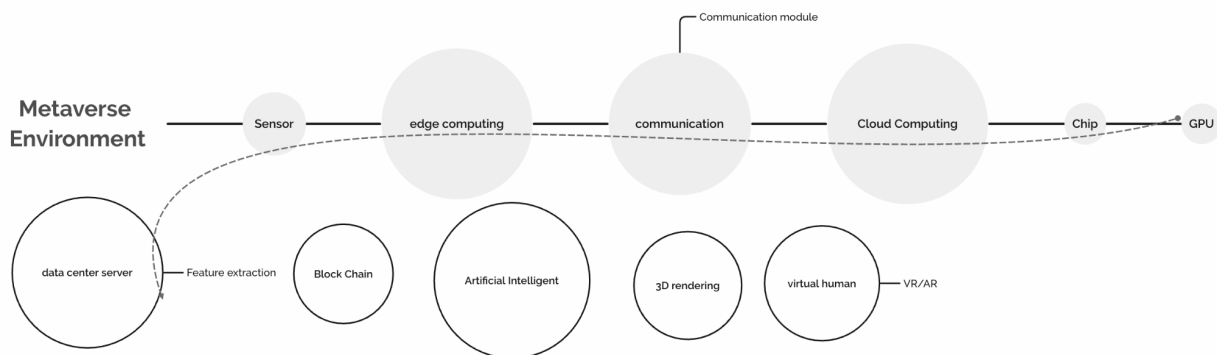


Figure 8. Metaverse Industry Sections (Infrastructure & Software)

The Metaverse Environment contains Sensor, edge computing for infrastructure. To maintain the virtual technology, communication, Cloud Computing, GPU, data center server, BlockChain, Artificial intelligence should also be developed. 3D rendering and virtual humans (VR/AR) are the ultimate expressions, as shown in Figure 8.

## 2.6 Some significant signs of upcoming Metaverse

One of the newest stuff that metaverse brings to us is virtual assets. Unlike the financial derivatives, the virtual assets had nothing related to reality. The assets in the metaverses are based on the concept of NFTs (non-fungible tokens – unique digital tokens that are not interchangeable) and can exist on blockchains even outside of the metaverses. To connect virtuality and reality, cryptocurrency takes the dominant place as the tool for the transaction. Participants chose to invest in the virtual estate, NFT, etc.

The Sandbox was originally launched in 2012 as a game on iOS and Android. In 2018, The Sandbox was rebranded and rebuilt on the Ethereum blockchain. It became one of the most popular metaverses and users can purchase LAND and create ASSET to be used in the ecosystem. LAND is an NFT representing a unique digital piece of real estate (identified by coordinates) where 166,464 LANDs (408x408) form a map of The Sandbox metaverse. Each LAND can be bought and sold separately or together as an ESTATE.[11]

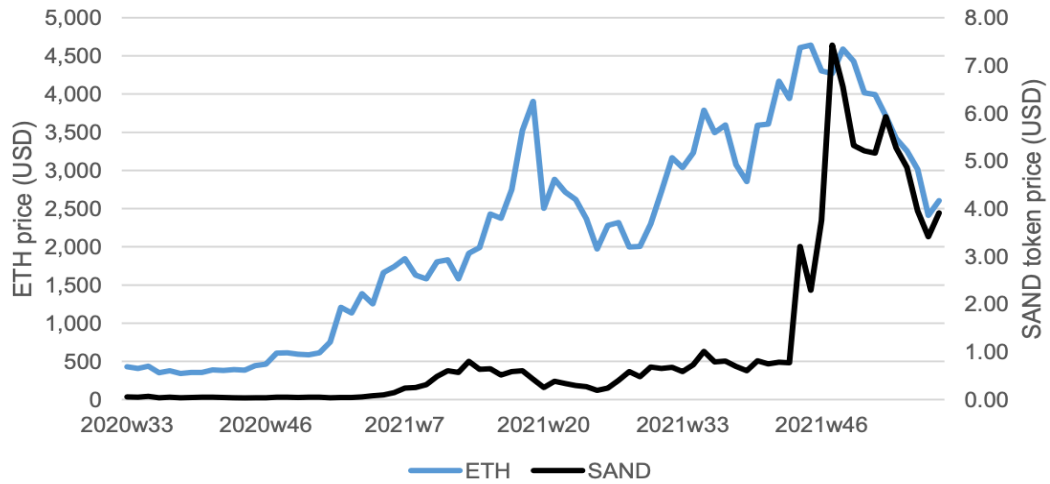


Figure 9: ETH and SAND prices [10]

$$p_{it} = \sum_t \delta_t + \sum_j \beta_j x_j + \varepsilon_{it} \quad (2)$$

To create all-sales price indices, we use the hedonic price index method (Fisher, Geltner, and Webb, 1994; Hill, 2013) and regress log prices on controls and indicator variables  $\delta t$  for each week-year as specified in Equation 1. The exponents of  $\delta t$  are the index levels for each period. [10]

From here, we know that people tend to invest more on the virtual asset in the metaverse, which shows that people’s perspective on this new industry metaverse is positive. And this is a good signal for all of these companies to keep working on this track more staunchly, as shown in Figure 9.

### 2.7 Some potential risk of metaverse

At present, the metaverse industry ecosystem is in a chaotic period, and some people may exaggerate its role or utility, and there may be many corresponding problems in the real world. It should be noted that most of the risks exist in today's PC Internet and mobile Internet, and are not unique to the Metaverse. Such as capital manipulation, economic bubbles, indulging in risks, and so on. But in the end, we are pleased to see that the development of the Internet has not made people addicted, but has greatly promoted the development of productivity. This essay analyzes ten potential fields that will impact the merging metaverse industry, as shown in Table 2 and Table 3.

Table 2 Ten potential fields (1-5) impacting the merging metaverse industry

| <u>Capital manipulation</u>  | <u>Opinion bubble</u>   | <u>Ethical constraints</u>  | <u>Monopoly tension</u>   | <u>Industry involution</u>   |
|--|---|---|---|--|
| There are still many uncertainties in the metaverse in its embryonic stage, and the industry and the market urgently need to return to rationality | Irrational public opinions bubbles can lead to irrational stock market shocks | How to build a consensus on the ethical framework of the metaverse in a distributed framework still needs to learn from many dimensions | The competitive situation among the giants determines the relative closedness of their ecology, and the complete openness distributed is difficult to achieve | Conceptual breakthroughs do not fundamentally change the involution of the Internet industry |

Table 3 Ten potential fields (6-10) impacting the merging metaverse industry

| <i>Computation</i>  | <i>Economics</i>   | <i>Fascination</i>   | <i>Privacy</i>   | <i>Intellectual property</i>   |
|---|--|--|--|--|
| How to ensure the stability of cloud computing, low-cost computing resources, and many other issues need to be resolved | Economic risks may be transmitted from the virtual world to the real world | Excessive addiction to virtual worlds may also exacerbate psychological problems such as social fear and social alienation | Individual privacy data, as the underlying resource supporting the continuous operation of the Metaverse, needs to be continuously updated and expanded. Data resources are collected, stored, and managed in compliance with the regulations yet to be discussed. | In the future, there may be opportunities to create human-computer interaction methods or content beyond existing cognition, which is a greater challenge for intellectual-property protection |

### 3. Conclusion

In our final analysis, the metaverse is the necessary step we have to take. Based on what we have discussed above, the current saturated situation of the internet field has caused stagnation, which could barely make progress anymore. The growth rate of revenue had decreased from 0.3 to 0.16 since 2018. Thus, the existence of metaverse has given these companies, even the entire society, a way to solve the problem and a new field to explore. In addition, when this concept is mentioned, each company would recruit the related talents to help them achieve their goals, which could provide hundreds of job opportunities and promote the progress of the technology. Many people would doubt the future of metaverse because there is only a concept laying out in front of the people, without any related technical support. However, when we turn back to 100 years ago when lots of people were confused by the inconvenience of delivering mail or lack of interest in life, the people at that time still did not believe that one day in the future they could use mobile phones to accomplish almost everything they want, like sending instant messages. However, our desire is never gonna be satisfied, and this always pushes us to progress. Just like what Zuckerberg said, “We should take on the challenges that will be the most impactful, even if the full results won’t be seen for years.”[11] Now we are standing at the same view as them, it’s still reasonable for us to have a positive vision for our future, no matter how many challenges are we going to face.

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