
INDUSTRY OVERVIEW

Certain information and statistics set out in this section and elsewhere in this document are derived from various government and other publicly available sources and from the market research report prepared by iResearch. iResearch is an independent industry consultant engaged by us, and we commissioned iResearch to prepare a market research report. The information from official government sources set out in this Industry Overview has not been independently verified by us, the [REDACTED], the [REDACTED], the [REDACTED], the [REDACTED], any of the [REDACTED], any of our or their respective directors, officers, employees, advisors, agents or representatives or any other party involved in the [REDACTED] except iResearch and no representation is given as to its accuracy. For discussions of risks relating to our industry, please see the paragraph headed “Risk Factors — Risks Relating to Our Business and Industry” in this document.

SOURCE OF INFORMATION

Founded in 2002, iResearch is an independent provider of online user data and consumer insights in China. Headquartered in Beijing and Shanghai, iResearch has a management team with over 400 employees worldwide and has accumulated extensive experience in researching and monitoring the development of the AR/VR industry and Metaverse in the PRC.

We have agreed to pay a commission fee of RMB0.55 million for the report prepared by iResearch (“**iResearch Report**”). Data for the iResearch Report on market size and users is mainly obtained through interviews with industry participants, marketing surveys, secondary sources and other research methods. Due to the limitations of such research methods, sample and size and scope of data collection, such data may not precisely reflect actual market conditions.

iResearch has prepared the iResearch Report on the assumptions that (i) the global and China’s social, economic and political environments will remain stable during the forecast period, providing a sustainable and steady development for AR/VR industry and Metaverse; and (ii) the data quoted from authoritative agencies remains unchanged. The market size and related data contained in the iResearch Report are mainly obtained through relevant interviews with industry professionals, secondary data sources and other research methods. Due to limitations in research methods, sampling and data collection scale and scope, relevant data may not accurately reflect the actual market conditions. iResearch has made the forecasts on relevant market sizes in China based on the factors including (i) historical data of market sizes in China, (ii) public documents and other public information related to the AR/VR industry and Metaverse, (iii) other experts’ forecasts and (iv) iResearch’s view and estimates on the development of these industries. iResearch believes that the basic assumptions used in preparing the iResearch Report, including those used to make future projections, are correct, reasonable and not misleading. iResearch has independently analyzed the information obtained from its research, but the findings contained in the iResearch Report largely rely on the accuracy of the information collected.

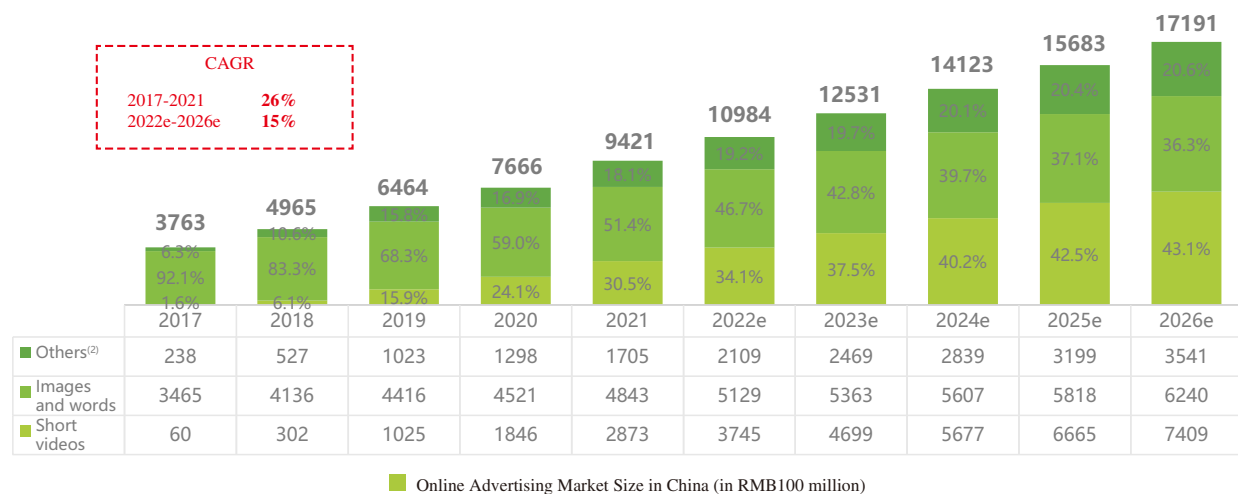
Except as otherwise noted, all of the data and forecasts contained in this section are derived from the iResearch Report. After making reasonable inquiries, our Directors confirm that there has been no adverse change in the market information presented in the iResearch Report since the date of its issuance which may materially qualify, contradict or impact the information in this section.

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THE ONLINE ADVERTISING MARKET IN CHINA

At present, online advertising is mainly in the forms of image, text and video. With the application and popularization of AR/VR technology in marketing and advertising industries, more advertising materials and marketing forms are expected to be presented in AR/VR in the future. Compared with traditional marketing methods including online advertising in the forms of image, text and video, AR/VR marketing can better capture the attention of end users and engage them. As AR/VR marketing offers widened channels to interact with end users, AR/VR advertisers can obtain a deeper understanding of end users’ behavior preference and improve the accuracy to distribute advertisements. In addition, compared with traditional marketing methods, AR/VR marketing model created in the context of cloud computing, big data and social media is intelligent, scene-based, customized, personalized and socialized, through which end users who are unfamiliar with a brand can interact with each other and gain a better understanding of such brand, buy the products and thus be converted to a customer of the brand. The AR/VR marketing market is a major component of the AR/VR content and services market. The market size of online advertising market in terms of revenue in China is approximately RMB376.3 billion in 2017 and grew to RMB942.1 billion in 2021, representing a CAGR of 26%. From 2022 to 2026, the online advertising market is expected to increase from RMB1,098.4 billion in 2022 to RMB1,719.1 billion in 2026, representing a CAGR of 12%.

Online Advertising Market Size in China (by Revenue), 2017 - 2026E⁽¹⁾



Notes:

- (1) Market size refers to the total revenue of online advertising service in the PRC. The figures for 2022 to 2026 are estimated figures.
- (2) Others include online AR/VR marketing service.

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OVERVIEW OF AR/VR CONTENT AND SERVICES MARKET IN CHINA

Introduction of AR/VR Content and Services Market in China

The AR/VR content and services market is the scenario application tier of the Metaverse ecosystem. The scenario application tier of the Metaverse ecosystem provides scenario application construction which comprises AR/VR content and services. Various AR/VR applications such as VR cloud stores, AR/VR education and AR/VR marketing are the embodiment of the Metaverse’s immersive virtual world.

The AR/VR content and services market in China refers to a market comprising the AR/VR content market and the AR/VR services market. The AR/VR content market in China refers to the segmented markets in which the content providers provide AR/VR content in various vertical industries for commercialization. AR/VR content includes entertainment content, educational content, among others. The AR/VR services market in China refers to the segmented markets in which the services providers provide AR/VR services to customers for commercialization. The AR/VR services mainly include marketing and e-commerce.

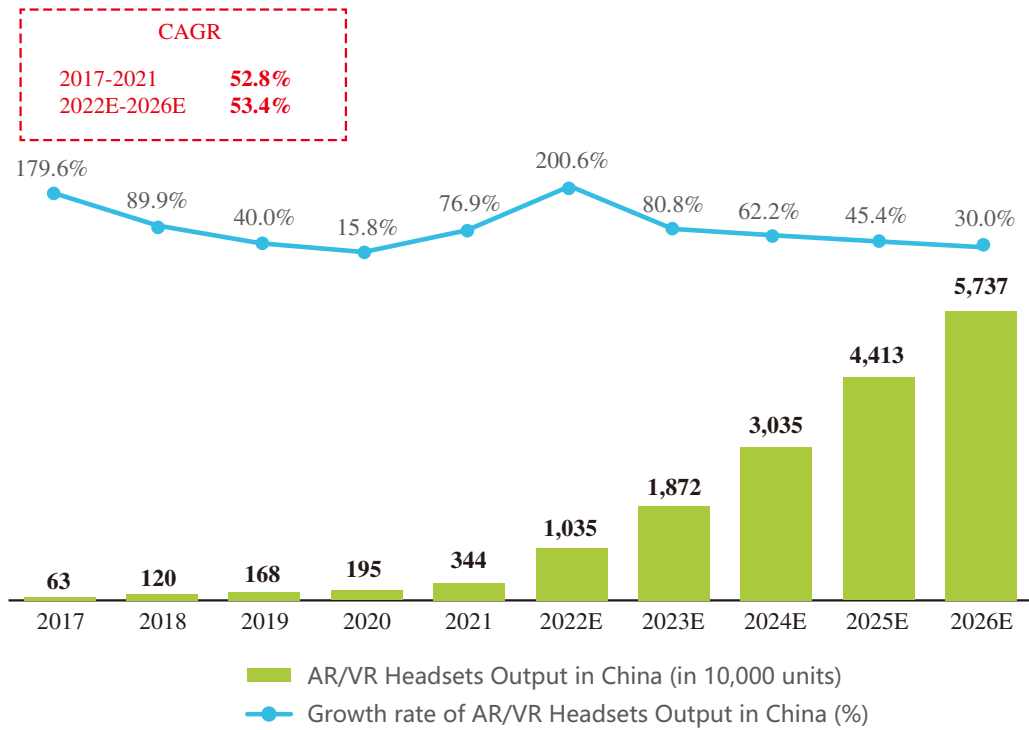
AR/VR hardware market

The AR/VR hardware market and the content and services market form a two-way virtuous circle. On the one hand, with the increase in the AR/VR hardware’s output, its popularity, the user penetration and the manifestation of the commercial value, more AR/VR content providers will be attracted to enter the market and upgrade the content production technology and its functions. Through the improvement of the content supply and the continuous optimization of the quality, more users will be attracted and thereby enhancing the content monetization ability. On the other hand, when the quantity and quality of the content are improved, the demand for AR/VR hardware such as headsets and glasses will increase as the users would desire better experience of the content.

The output of AR/VR headsets in China is expected to grow from 10.4 million pieces in 2022 to 57.4 million pieces in 2026. The output of AR/VR headsets is expected to grow at a slower pace after 2022 because (1) the purchases of AR/VR headsets were postponed due to the COVID-19 pandemic leading to more demands in 2022 and (2) Metaverse has been a heated topic since the second half of 2021 and brought more demands for AR/VR headsets in 2022. The penetration rate of AR/VR headsets among netizens in China is expected to grow from 1.0% in 2022 to 4.5% in 2026. The growth of output of AR/VR headsets is expected to supplement the development of the AR/VR content market in China as more users are expected to have access to AR/VR headsets, which are a crucial medium to improve the AR/VR content viewing experience. In addition, as the current penetration rate of AR/VR headsets among netizens in China is relatively low, the markets for AR/VR headsets and AR/VR content have growth potentials. China is one of the countries with early emergence of popular AR/VR market. China has accumulated hardware production experience with continuous growth of AR/VR hardware output in recent years. The technology of Chinese AR/VR hardware component manufacturers has been valued by leading multinational corporations who engaged Chinese manufacturers as subcontractors and purchased from the Chinese manufacturers. In addition, China has introduced policies encouraging the cultivation of talents in VR which will further support China’s development of AR/VR hardware technology. Based on the above, while AR/VR hardware related technology in China has certain advantage in the global market, there is still room for improvement.

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AR/VR Headsets Output in China, 2017-2026E

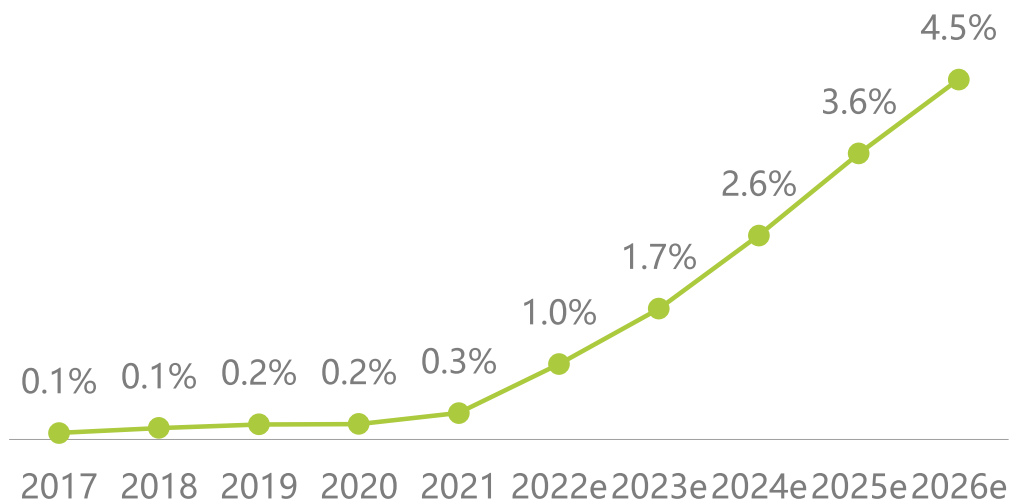


Note:

(1) The figures for 2022 to 2026 are estimated figures.

Source: iResearch

Penetration Rate of AR/VR Headset Output among Netizens in China, 2017-2026E



Note:

The penetration rate is the percentage figure of AR/VR headsets output among netizens in China, assuming that all netizens have demand for AR/VR headsets and AR/VR headset output can satisfy the demand of netizens.

Source: China Internet Network Information Center; iResearch

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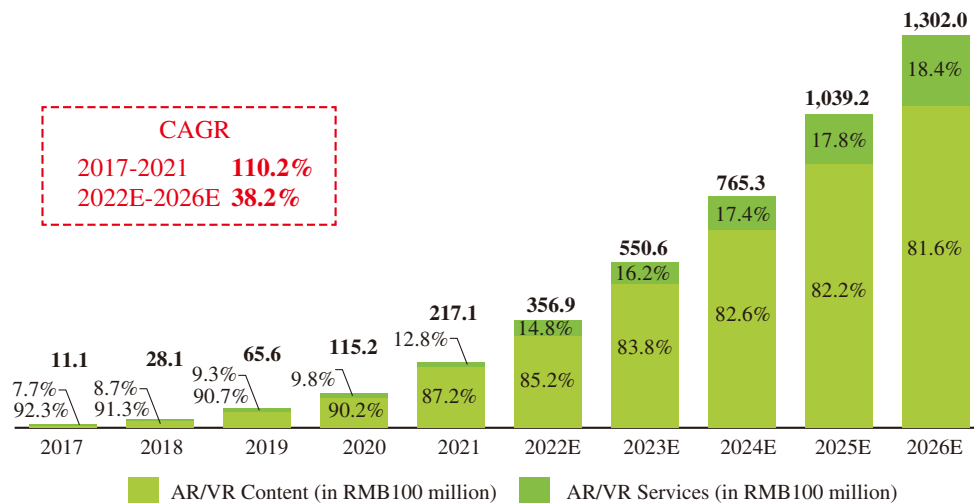
Market Size of AR/VR Content and Services Market in China

Since 2016, AR/VR technology had been increasingly applied in different scenarios, and China’s AR/VR content and services market has also begun to develop. The market size of the AR/VR content and services market in terms of revenue increased from RMB1.1 billion in 2017 to RMB21.7 billion in 2021, representing a CAGR of 110.2%. The AR/VR content and services market in China is currently at a stage of rapid development. With the continuous growing of AR/VR content and services application in various industries, the market size of the AR/VR content and services market in terms of revenue is expected to reach RMB130.2 billion in 2026, representing a CAGR of 38.2% during the period of 2022 to 2026.

The AR/VR content market has a dominant market position currently in the AR/VR content and services market. However, with the increasing popularity of AR/VR technology in marketing and e-commerce, more companies are expected to adopt innovative AR/VR marketing or VR e-commerce cloud store. The market share of the AR/VR services market in the AR/VR content and services market is expanding and is expected to reach 18.4% in 2026 from 12.8% in 2021.

The AR/VR content and services market in China mainly covered marketing, e-commerce, culture and tourism, industrial manufacturing, healthcare, real estate and home, live-streaming, education, gaming and entertainment as of 2021. In 2021, gaming, entertainment and education were the three largest industries in the AR/VR content and services market in terms of revenue. It is expected that revenue from gaming, entertainment and education will grow at CAGRs of 30.2%, 38.7% and 35.6% from 2022 to 2026, respectively, reaching RMB24.4 billion, RMB23.8 billion and RMB16.5 billion, respectively, in 2026.

AR/VR Content and Services Market Size in China (by Revenue), 2017-2026E⁽¹⁾



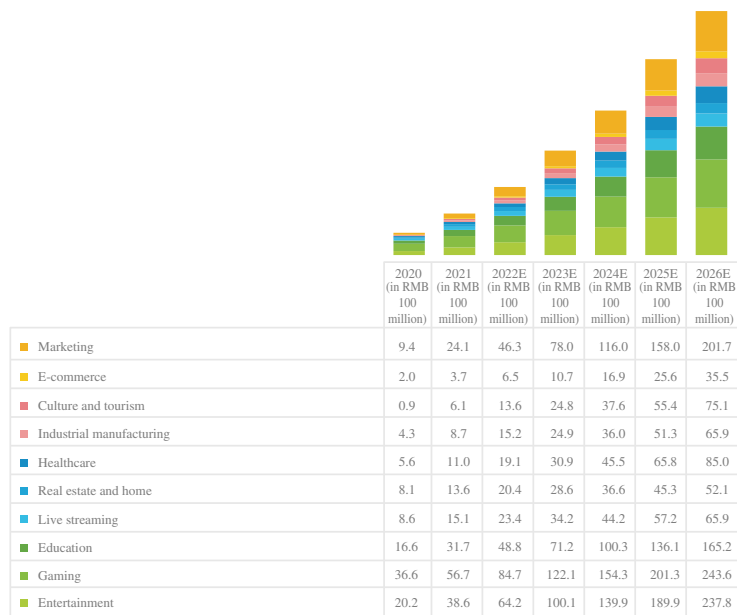
Note:

(1) Market size refers to the total revenue of AR/VR content and services generated by AR/VR content and services providers in the PRC. The figures for 2022 to 2026 are estimated figures.

Source: iResearch

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AR/VR Content and Services Market Size by Industry in China (by Revenue), 2020-2026E⁽¹⁾



Notes:

- (1) Market size refers to the total revenue of AR/VR content and services generated by AR/VR content and services providers in the PRC. The figures for 2022 to 2026 are estimated figures.
- (2) Data for AR/VR content and services market size by industry for 2016 to 2019 are not available due to the small market size of the AR/VR content and services market from 2016 to 2019.

Source: iResearch

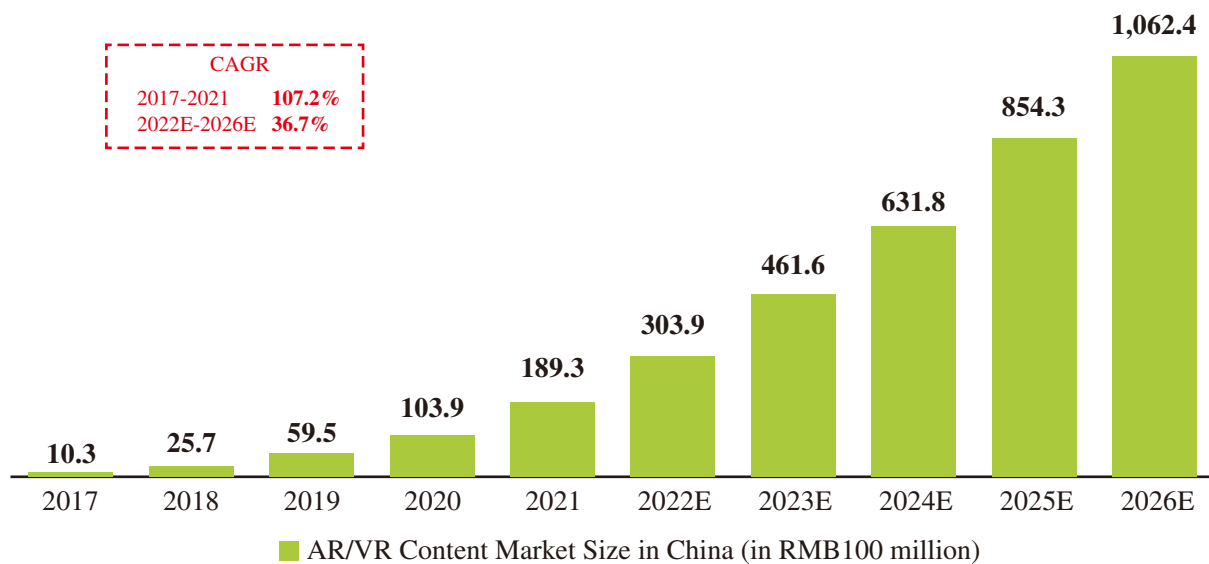
The AR/VR Content Market in China

The AR/VR content market refers to the market that focuses on providing content, building scenarios, and providing solutions using AR/VR technology for various industries. As the industry chain continues to expand and content continues to accumulate, AR/VR content is expected to be fully integrated with applicable vertical industries, driving industry changes, spawning more business models and creating more business value.

The market size of the AR/VR content market in terms of revenue in China is approximately RMB1.0 billion in 2017 and grew to RMB18.9 billion in 2021, representing a CAGR of 107.2%. As the AR/VR content needs to be produced or presented through AR/VR hardware, its market size is limited by the hardware penetration rate. Compared with the rapid development of AR/VR hardware market abroad, the AR/VR hardware market in China suffered from poor user experience and high price. As a result, the AR/VR content market in China mostly served business-end users in the current stage. However, with the advancement in technology, the quality of AR/VR hardware in China has been significantly improved in recent years, and the price of which also decreased. The consumer-level VR products had gradually emerged in the market and the AR/VR industry has entered a positive cycle of growth, with the increase in users leading to the increase in income for the hardware developers and content providers, subsequently leading to optimization of experience and further increase in users. From 2022 to 2026, the AR/VR content market is expected to increase from RMB30.4 billion in 2022 to RMB106.2 billion in 2026, representing a CAGR of 36.7%.

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AR/VR Content Market Size in China (by Revenue), 2017-2026E⁽¹⁾



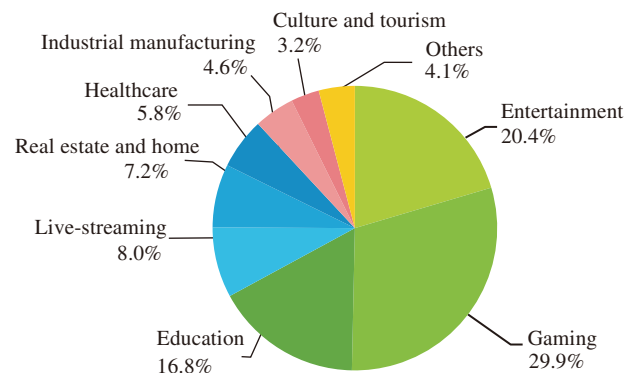
Note:

(1) Market size refers to the total revenue of AR/VR content generated by AR/VR content providers in the PRC. The figures for 2022 to 2026 are estimated figures.

Source: iResearch

AR/VR content comprises (i) gaming content, (ii) entertainment content, (iii) educational content, (iv) live-streaming content, (v) real estate and home content, (vi) healthcare content, (vii) industrial manufacturing content, (viii) culture and tourism content and (ix) others, which accounted for 29.9%, 20.4%, 16.8%, 8.0%, 7.2%, 5.8%, 4.6%, 3.2% and 4.1% of the AR/VR content market, respectively, in 2021.

AR/VR Content Market Composition in China (by Revenue), 2021⁽¹⁾



Note:

(1) Market composition refers to the total revenue of AR/VR content generated by AR/VR content providers in the PRC in 2021.

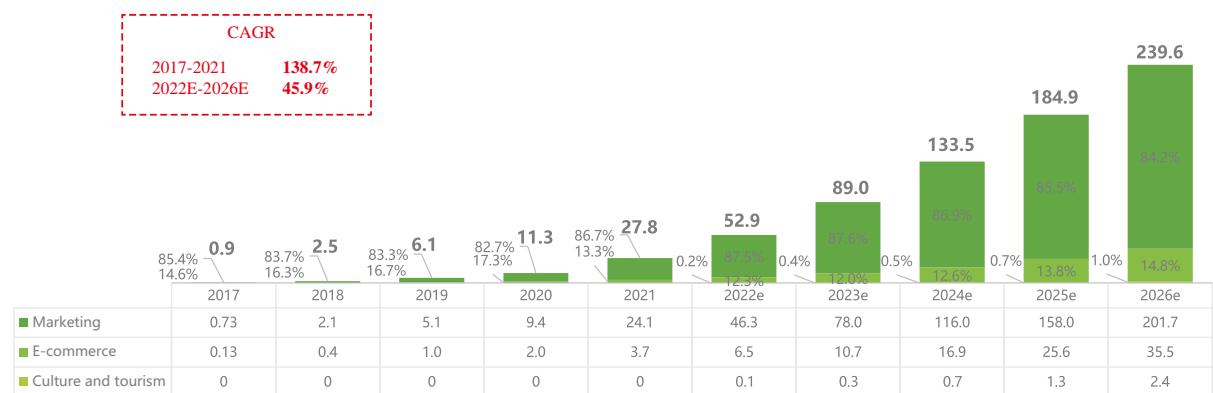
Source: iResearch

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The AR/VR Services Market in China

The AR/VR services market refers to the market that focuses on creating overall solutions to address customers’ business needs. The AR/VR services providers often generate revenue based on performance effect and may be involved in customers’ AR/VR-related operation. The AR/VR services market in China mainly includes AR/VR marketing and AR/VR e-commerce. Any industry with a need in marketing and sales may have a demand for the AR/VR services. Compared with the AR/VR content market, the development of the AR/VR services market in China started relatively late. The market size in terms of revenue increased from approximately RMB90 million in 2017 to RMB2.8 billion in 2021, representing a CAGR of 138.7%. As the usage of AR/VR content increased in marketing and e-commerce scenarios, more advertising customers and merchants have begun to invest marketing budgets in AR/VR services. The market size of the AR/VR services market in terms of revenue is estimated to increase from RMB5.3 billion in 2022 to RMB24.0 billion in 2026, representing a CAGR of 45.9%. As marketing is needed in all kinds of industries, AR/VR marketing has been the largest component in the AR/VR services market historically. AR/VR marketing also has significant growth potentials with the increasing popularity of AR/VR in marketing. In addition, with AR/VR gaining popularity and corporate customers valuing performance effect of services, it is expected that performance-based services other than AR/VR marketing have potential to grow in the AR/VR services market.

AR/VR Services Market Size in China (by Revenue), 2017-2026E⁽¹⁾



AR/VR Services Market Size in China (in RMB100 million)

Note:

- (1) Market size refers to the total revenue of AR/VR services generated by AR/VR services providers in the PRC. The figures for 2022 to 2026 are estimated figures.

Source: iResearch

The current forms of online advertising are mainly graphics and videos. With the popularization of AR/VR technology in marketing, more advertising materials and marketing channels are expected to be presented in the form of AR/VR in the future. As the essence of marketing is to attract and transform consumers, AR/VR with its strong visual effect and rich

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interactive content has unique application potential in the marketing industry. With the continuous improvement of the underlying technology, AR/VR-based marketing methods have become more innovative and effective.

One typical application of AR/VR e-commerce is VR cloud store. VR cloud store services refer to the online virtual store built on an e-commerce platform. Combined with VR technology and presentation methods, VR cloud store can maximize the realization of a complete and real shopping experience for consumers. The main model of China’s VR cloud store is through e-commerce platforms. Merchants can develop and design the cloud store by cooperating with an e-commerce platform or suppliers. At present, the business model of China’s VR cloud store is still in its infancy. As more merchants join, this market segment is expected to be further developed in the future.

Market Drivers of AR/VR Content and Services Market in China

- *Mature hardware technology.* With the maturity of technology, significant improvement in hardware equipment and decrease in its price, quality content and hardware equipment will form a virtuous cycle. On the one hand, quality content will promote the sales of equipment. On the other hand, the increase of hardware devices penetration rate will encourage content developers to increase investment. The virtuous cycle is expected to accelerate the AR/VR market expansion.
- *Infrastructure Optimization.* The high bandwidth and low latency characteristics of 5G and Wi-Fi 6 are the driving forces for AR/VR content and services. 5G and Wi-Fi 6 are expected to enrich the usage scenarios including ultra-high-definition streaming media. Meanwhile, wireless devices significantly improve the user experience and further support the application of devices in outdoor scenarios. Cloud AR/VR services based on cloud computing can effectively solve the problem posted by expensive and heavy devices, as well as promote the popularization of AR/VR and development of AR/VR content.
- *Industry upgrading needs.* Implementation of AR/VR in the business-end represented by AR/VR education content is accelerating. In K12, higher education, vocational training and various training scenarios, AR/VR content can enrich the teaching methods. Meanwhile, as the commercialization of 5G featuring low latency, large capacity and high speed continues to advance, the application of AR/VR solutions are expected to grow in industries with high standards for stable content images and low latency transmission, such as healthcare (i.e. clinical assistance, remote therapy) and manufacturing (i.e. inspection and repair, assembly) industries. In addition, industries such as culture and tourism, entertainment and e-commerce industries, are also focusing increasingly on the application of AR/VR solutions due to the demand to strengthen the experience of end users and reconstitute offline experience.
- *Consumption upgrading needs.* The growth of consumer base provided market prospects and business opportunities for AR/VR content, forming a virtuous cycle between hardware improvement and content quality improvement. The implementation of 5G will also strongly support improvement of consumers’ AR/VR experience, development of AR/VR applications and strong demand for gaming, video watching and live-streaming.
- *Continued capital investment.* In 2020, the sales volume of AR/VR equipment increased significantly due to the COVID-19 pandemic. The development of the production lines of components and finished products in each phase of the industry chain were expanded.

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Continuous breakthroughs in key technologies also drove the expansion of market demand. R&D projects and capital investment in AR/VR industry increased significantly which drove rapid growth.

- *Driven by favorable policies.* The AR/VR content and services market is expected to continue to develop under favorable policies. The Guiding Catalogue on Adjusting the Industry Structures (2019 Version) released by the National Development and Reform Commission of the PRC in April 2019, included VR and AR in the “encouraged” industries. The Opinions on Deepening “Internet + Tourism” and Promoting High-quality Tourism Development released in November 2020 proposed to focus on technology empowerment, promote the application and popularization of information technology such as 5G, big data, cloud computing, Internet of Things, artificial intelligence, virtual reality, augmented reality and blockchain. On March 24, 2020, the Ministry of Industry and Information of the PRC issued the Notice Concerning Promoting the Accelerated Development of 5G* (《工業和信息化部關於推動5G加快發展的通知》), which stated that the country should stimulate the consumption of new kinds of information such as 5G and AR/VR. In June 2020, the Ministry of Education of the PRC released the Specification for Digital Campus of Vocational Schools* (《職業院校數字校園規範》), which proposed to permeate education and teaching, internship and training, school management, cultural transmission, campus life and social services and other aspects with digitization, networking and intelligence, based on the application of various information technologies such as the Internet, big data, cloud computing, Internet of Things, artificial intelligence, 5G, AR/VR and blockchain.

Future Trends of AR/VR Content and Services Market in China

- *Growing penetration of industry scenarios application.* With the maturity of AR/VR technology and the popularization of equipment, AR/VR is likely to become a more popular form of content presentation. More application will be explored and developed in different industries such as construction, mining and other industries, promoting the diversification and scale of the AR/VR content and services market.
- *Popularization of providing AR/VR content and services based on SaaS platform.* The current AR/VR content and services delivery model is mainly divided into two types: customization and standardization. Customization is a more mainstream delivery model. As the market accumulated sufficient content elements or functional modules, standardized services are expected to be developed to serve customers more efficiently, such as a complete solution based on SaaS platforms. At the same time, the big data and artificial intelligence technology will also promote digital and intelligent upgrades of SaaS platform-based solutions, making more accurate adaptations to customer needs. With the empowerment of the SaaS model, AR/VR content and services providers can improve their delivery efficiency. Compared to the customization model that requires personalized services for customers, the SaaS model can accumulate a large number of standardized functions and materials while reducing the time spent on redeveloping and recreating functions and materials, and thus improving efficiency.
- *Importance of one-stop service capability.* The AR/VR content and services market will gradually develop into a mature industry chain. In addition to AR/VR content production, enterprises also need more integration services such as creative strategy before production and channel promotion post production. In the future, the capability to offer one-stop service will become an important criteria of enterprises in AR/VR industry.

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Entry Barriers and Core Success Factors of AR/VR Content and Services Market in China

AR/VR content production technology and experience

- AR/VR content production is the core capabilities for AR/VR content and services providers. AR/VR content production technology and experience are the key market entry barriers for AR/VR content and services providers.
- Technical capabilities are the key to enhancing AR/VR content and services providers’ service reputation and establish long-term customer relationships. At the same time, the continuous strengthening and accumulation of service experience can help AR/VR content and services providers understand and respond to customer needs more efficiently.

Ability to understand industry demand

- Demand side of AR/VR content includes a wide range of industries with strong demand differentiation. At the same time, demand side of AR/VR services in different industries may have different production directions and placement preferences. As a result, the ability to understand vertical industry demand becomes one of the market entry barriers for AR/VR content and services providers.
- Better understanding of industry demands will help AR/VR content and services providers to improve their understanding of customer needs and response efficiency. At the same time, the ability to understand the needs of multiple industries will help AR/VR content and services providers expand their services to customers in different industries.

Media platforms and accumulation of placement data

- The core business model of AR/VR services providers is AR/VR marketing and e-commerce. One of the entry barriers for AR/VR services providers is the relationship with media platforms and their agents which undertake AR/VR marketing placement and possess accurate data that can help the placement of AR/VR marketing content.
- Expanding the number of media platforms can help AR/VR services providers to meet different marketing demand on different platforms. At the same time, the application of AR/VR marketing placement data can improve AR/VR services providers’ ability to accurately place their AR/VR marketing content, which in turn can enhance customer satisfaction and stickiness.

Competitive Landscape of AR/VR Content and Services Market in China

With over 5,000 competitors in the market, the AR/VR content and services market in China is highly fragmented. As the largest AR/VR content and services provider in terms of revenue in 2021, our Group only had a market share of 2.6%.

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Market share of AR/VR content and services provider (By Revenue) in China, 2021

Ranking	Company	Year of Establishment	Principal Business	Background	AR/VR Content and Services Revenue ⁽¹⁾ in 2021 (in RMB100 million)	Market Share in 2021 (by revenue)
1	Our Group	2008	<ul style="list-style-type: none"> AR/VR marketing services AR/VR Content AR/VR SaaS 	A provider in China of the AR/VR content and services market.	5.6	2.6%
2	Shanghai Graphic Digital Information Co., Ltd.* (上海曼恒數位技術股份有限公司)	2007	<ul style="list-style-type: none"> VR Content 3D Printing 	A NEEQ listed VR content provider (in education, high-end manufacturing, medical and military industries) and 3D printing services provider in China.	~2.0	0.9%
3	Beijing Runnier Network Technology Co., Ltd.* (北京潤尼爾網絡科技有限公司)	2007	<ul style="list-style-type: none"> AR/VR Content 	A non-publicly listed AR/VR content provider focused on the education industry in China.	~1.8	0.8%
4	Beijing Growlib Science and Technology Co., Ltd.* (北京格如靈科技有限公司)	2016	<ul style="list-style-type: none"> AR/VR Content 	A non-publicly listed AR/VR content provider focused on the education industry in China.	~1.0	0.5%
5	Shenzhen Jimuyida Technology Co., Ltd.* (深圳積木易搭科技技術有限公司)	2015	<ul style="list-style-type: none"> AR/VR Content 	A non-publicly listed VR content provider (in exhibition, household, culture and tourism and other industries) in China.	~0.7	0.3%

Notes:

- (1) Revenue comprises revenue of AR/VR services and AR/VR content, among which, the AR/VR services include AR/VR marketing services and AR/VR e-commerce services, and the AR/VR content include entertainment content, educational content, live-streaming content and others.

Source: iResearch

The AR/VR services market is an increasingly important sub-market of the AR/VR content and services market. The market share in terms of revenue of the AR/VR services market in the AR/VR content and services market was 12.8% in 2021 and is expected to grow and reach 18.4% in 2026. Our Group is a major player in the AR/VR services market in China with a market share of 13.5% in terms of revenue in 2021.

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Market share of AR/VR services provider (By Revenue) in China, 2021

Ranking	Company	Year of Establishment	Principal Business	Background	AR/VR services revenue ⁽¹⁾ in 2021 (in RMB100 million)	Market share in 2021 (by revenue)
1	Our Group	2008	<ul style="list-style-type: none"> AR/VR marketing services AR/VR content AR/VR SaaS 	A provider in China of the AR/VR content and services market.	3.76	13.5%
2	It Said Information Technology Services (Shanghai) Co., Ltd.* (它說信息科技服務(上海)有限公司)	2016	<ul style="list-style-type: none"> AR/VR services AR/VR SaaS 	A non-publicly listed AR/VR marketing solution services provider in China.	~0.26	0.9%
3	Visionstar Information Technology (Shanghai) Co., Ltd.* (視辰信息科技(上海)有限公司)	2012	<ul style="list-style-type: none"> AR marketing 	A non-publicly listed AR marketing solution services provider in China.	~0.15	0.5%
4	Shenzhen Yunmei Network Technology Co., Ltd.* (深圳雲美網絡科技有限公司)	2016	<ul style="list-style-type: none"> AR/VR marketing Internet marketing tools development IP operation 	A non-publicly listed AR/VR marketing services provider in China, with business in social media marketing strategy operation, Internet marketing tools development and IP operation.	~0.10	0.4%
5	Xiamen Ant Agents Network Technology Co., Ltd.* (螞蟻特工(廈門)科技有限公司)	2016	<ul style="list-style-type: none"> AR marketing 	A non-publicly listed AR marketing services provider in China.	~0.06	0.2%

Notes:

- (1) Revenue comprises revenue of AR/VR marketing services and e-commerce services, among which, the e-commerce services include AR/VR cloud store and AR/VR display services in the e-commerce platform.

Source: iResearch

For further details on the competitive advantages of our Group, see the paragraph headed “Business — Our Competitive Advantages” in this document.

OVERVIEW OF METAVERSE ECOSYSTEM

Introduction of Metaverse Ecosystem

Metaverse generally refers to a virtual universe with a sustainable existence based on the real world through AR/VR and other technologies.

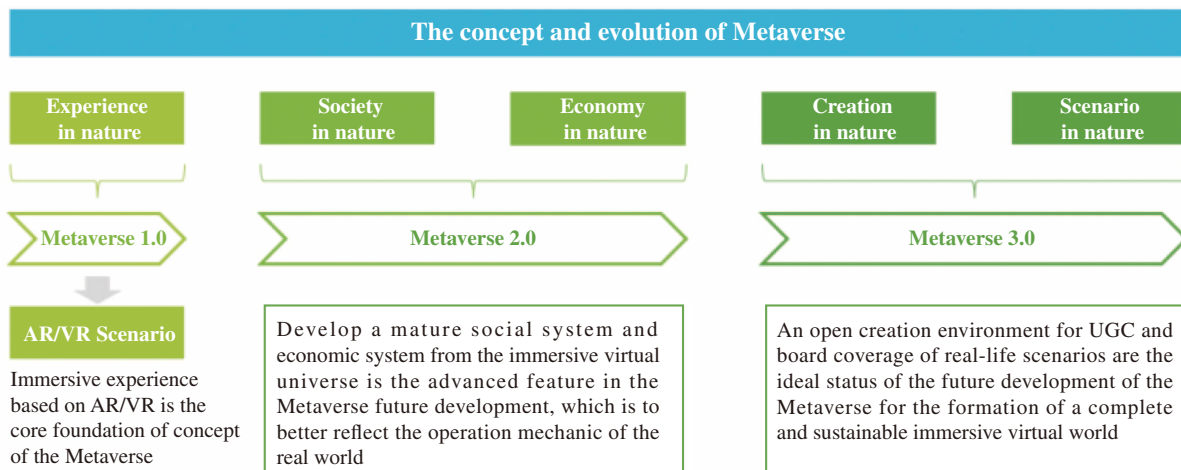
Metaverse is a constantly developing concept and industry. iResearch is of the view that the evolution of the Metaverse will go through three stages. At present, Metaverse is mainly at the 1.0 concept version stage, i.e. the experience attribute stage. All AR/VR scenarios can be regarded as the Metaverse of the current era.

At Metaverse 1.0 stage, the concept of Metaverse gradually turns into reality with the introduction of participants, capital and resources. Metaverse 1.0 stage is a stage of infrastructure development including upgrade of AR/VR hardware and development of AR/VR, 5G and aPaaS technologies and initial Metaverse platforms are being built. The core foundation of Metaverse is the immersive experience based on AR/VR technology. With the development of technology and business models, the virtual world under the Metaverse concept will continue to evolve. Metaverse 1.0 is the embryo stage of the Metaverse.

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When Metaverse develops into stage 2.0, large scale Metaverse platforms will emerge which will attract a large number of new users. Metaverse applications will be used in different settings. In order to satisfy the needs of users, there will be a high demand for new AR/VR content to support the expansion of Metaverse. It is expected that social systems and economic systems will be formed reflecting the operation mechanic of the real world. Metaverse 2.0 is the growth stage of the Metaverse.

At Metaverse 3.0 stage, the Metaverse ecosystem and major systems of virtual world will become mature. Cross platform and cross industry integration will take place. New usage and commercial models of the Metaverse will emerge. Popular AR/VR development tools will empower AR/VR creation by everyone. The virtual world is expected to form an open and creative environment for all developers, individuals and organizations to create new content. The virtual world is expected to have a broad coverage of real-life scenarios and can reflect all aspects of the users’ lives and form a complete and sustainable immersive world. Metaverse 3.0 is the advanced stage of the Metaverse.



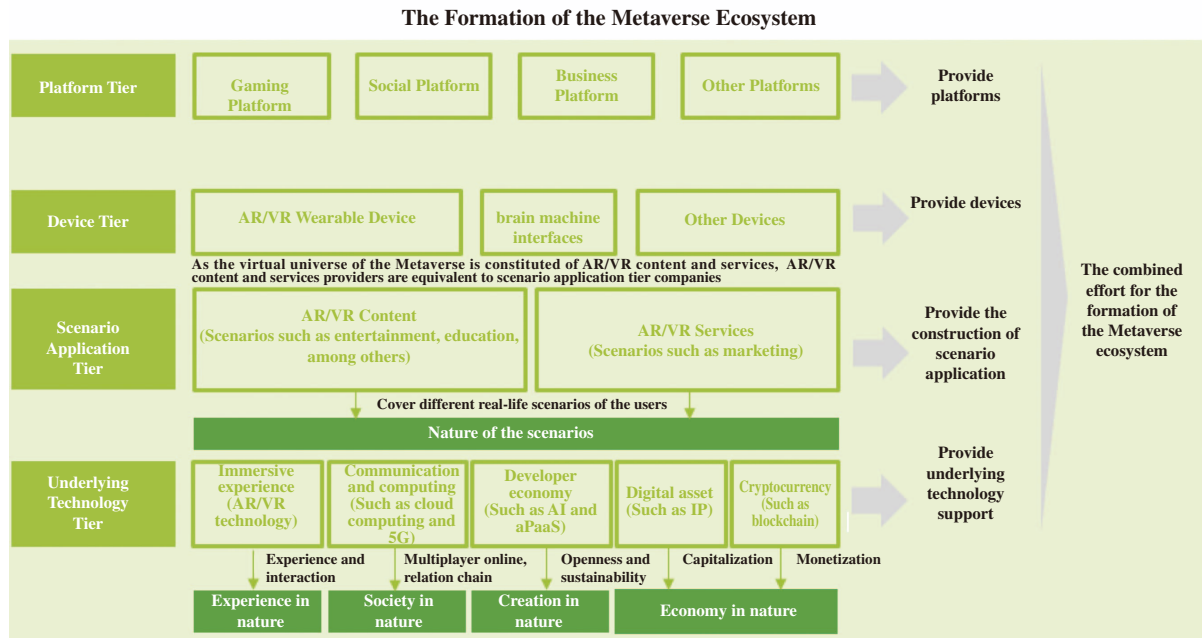
Metaverse Industry Chain Analysis

As shown in the chart below, the Metaverse ecosystem comprises four tiers, (i) the platform tier, (ii) the device tier, (iii) the scenario application tier and (iv) the underlying technology tier. All four tiers together make the Metaverse ecosystem. The platform tier comprises companies that directly operate the virtual universe of the Metaverse and provide services to end customers through platforms. The device tier comprises companies that provide devices for Metaverse experiences. The scenario application tier comprises service providers for business customers that construct the virtual universe of the Metaverse. As the virtual universe of the Metaverse is constituted of AR/VR content and services, AR/VR content and services providers are equivalent to scenario application tier companies. The underlying technology tier comprises companies that provide technology support for relevant parties in the Metaverse industry, for example the AI technology service providers.

AR/VR, as core applications for constructing the virtual world, is a pre-requisite and also an entry barrier in the development of the Metaverse. AR refers to augmented reality technology, which combines real scenes with virtual content and make them appear simultaneously in the same space to enable the AR users to actively interact with the AR content. The core features of AR are

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interactive and realistic. VR refers to virtual reality technology, which creates a virtual simulation scene for the users to be immersed in. Users can also experience and actively interact with the VR scene. The core features of VR are interactive, immersive and realistic.



There are currently no laws or regulations specifically governing Metaverse. There are, however, regulations governing the time for which minors may spend playing online games which may be applicable to gaming platforms of the Metaverse but irrelevant to other platforms or tiers. As we do not currently operate gaming platforms or plan to operate gaming platforms in the foreseeable future, the regulations governing the time for which minors may spend playing online games are not applicable to us.

Market Drivers of the Metaverse ecosystem

- *Underlying technologies of Metaverse continue to improve under favorable policies.* A number of national policies have explicitly mentioned plans and support for strengthening 5G, cloud computing, AR/VR, blockchain, artificial intelligence and other technology industries. All of these are key underlying technologies that drive the development of the Metaverse industry. For example, the MIIT promulgated the Notice concerning Promoting the Accelerated Development of 5G* (《工業和信息化部關於推動5G加快發展的通知》), which stated that China should boost promotion of new information consumption of 5G+AR/VR. The 14th Five-Year Plan and 2035 Long-Range Objectives approved by the Fourth Plenary Session of the 13th National People’s Congress, also mentioned the need to cultivate and grow emerging digital industries such as artificial intelligence, big data, blockchain, cloud computing, and network security.
- *Development and upgrades of equipment.* On the one hand, with the increasing popularity of AR/VR equipment, more users will have the opportunity to experience AR/VR in the future, which will promote the penetration of the Metaverse concept at the user’s end. On the other

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hand, with the exploration of technologies in brain-computer interface and other cutting-edge equipment, the interactive experience between users and the Metaverse will also be further enriched and enhanced in the future and thus drive the maturation of the Metaverse virtual world.

- *AR/VR content accumulation and sustainable creation method.* As the application of AR/VR technology widens in various industries and scenarios, a vast amount of AR/VR content that provides materials for constructing the Metaverse virtual world is being accumulated. In addition, as aPaaS and other technologies gradually mature and UGC content creation gain further popularity among users, a sustainable and open creation environment for all is likely to be formed to jointly promote the construction of the Metaverse ecosystem.
- *Imaginative commercial space.* The Metaverse industry can support a wide range of business models, such as marketing and advertising, commissions on sales, payment for content, user rewards, membership fee and digital asset trading.
- *Changing content consumption demand.* In 2021, Chinese Internet users’ penetration rate exceeded 70%, and digital content has a large consumption demand base. Users’ consumption habits for content are also constantly changing from text, pictures, videos to AR/VR. The virtual world content under the Metaverse ecosystem allows more realistic experiences and richer interactions, which is also more attractive to users.
- *The users’ habits in the virtual world.* Under the impact of the COVID-19 pandemic, a large number of offline activities have been transferred to online and users have more practical experience in living in and working through the Internet. The ultimate form of Metaverse is to project almost all aspects of real life into the virtual world. Therefore, users forming habits of transporting their daily activities online will provide a good base for the popularization of the Metaverse. In the post pandemic era, users are expected to have more demands for entertainment activities. The demand for AR/VR content and services cultivated during the outbreak of the pandemic is expected to continue to grow and therefore facilitate the application and development of the AR/VR content and services industry.
- *The establishment of industry associations.* The establishment of Metaverse related industry associations also promotes the development of the Metaverse industry. On October 15, 2021, the establishment of Metaverse Industry Committee (CMCA-MCC), a subordinate of China Mobile Communications Federation (CMCA), was approved. On November 11, 2021, the opening ceremony of the Metaverse Industry Committee of the China Mobile Communications Federation was officially held. CMCA-MCC is committed to promoting the healthy and sustainable development of the Metaverse industry.

Future Trends of Metaverse ecosystem

- *The concept of Metaverse driving the Internet industry into a new development stage.* The Internet industry has gradually developed from the PC era, to the mobile era and to the present stage. The Metaverse is expected to be the next development phase of the Internet, which is represented by the online world migrating into a virtual world with immersive and interactive experiences similar to those of the physical world. According to a declaration made by the Metaverse Industry Committee on November 11, 2021, Metaverse is the third generation of the Internet. As a result, more development opportunities and prospects are likely to be brought into the Internet industry.

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- *More opportunities for monetization and innovative business models.* The Metaverse can support almost all existing business models in the Internet industry with additional opportunities for development and expansion. At the same time, the Metaverse virtual world is a projection and extension of the real world. In 2005, Premier Li Keqiang first proposed the concept of “Internet plus traditional industries” (“**Internet Plus**”). Internet Plus refers to the use of information and communication technologies together with Internet platforms to deepen the integration of the Internet industry and traditional industries. The concept of Internet Plus is expected to be upgraded to a “Metaverse Plus” in the future, penetrating more conventional industries, developing more innovative business models and stimulating the commercial vitality of the Metaverse. The concept of “Metaverse Plus” is similar to the concept of “Internet Plus”, which refers to the integration of Metaverse technology and business model with traditional industries in order to promote the development and innovation of these industries and bring along more business opportunities, such as “Metaverse Plus Game” and “Metaverse Plus Education”.
- *Creating more job opportunities.* On the one hand, the construction of the Metaverse itself requires a lot of resources investment and creation accumulation, so that the Metaverse industry is expected to create more job opportunities. On the other hand, the Metaverse is a virtual world parallel to the real world, which is expected to have a stable social and economic system in the future. As a result, a large number of jobs for digital avatars may be created in the virtual world, even forming a sophisticated employment system.
- *More real-life scenarios enter the Metaverse virtual world.* With the growing maturity of the Metaverse construction and popularity among users in the future, it is possible that more daily life scenarios, not limited to entertainment and games, will enter the Metaverse virtual world and users’ reliance on the Metaverse will increase.