

## **Chapter 1 Question Analysis**

### **1.1 Background Analysis**

#### **1.1.1 Policy Side: industry regulation warm breeze blowing, generally to the good**

##### **(1) Value Provement: the game industry value spillover to release more performance**

Since late 2022, the regulatory end of the industry has repeatedly affirmed the value of the game industry. For example, 1) in November 2022, China Audio and Digital Association Game Industry Committee and China Game Industry Research Institute jointly released the "2022 China Game Industry Progress Report on Protection of Minors", which showed that the problem of minors being addicted to games was basically solved; 2) in November 2022, People's Financial Review advocated that the opportunity to deeply explore the value of the game industry should not be lost, and believed that overall China should give the game industry to a more objective and diversified cognition, strengthen strategic planning, focus on long-term layout, and promote the healthy development of the electronic game industry with equal emphasis on regulation and development, and promote its continuous release of new economic, cultural and technological values; 3) this time, Xinhua Daily Telegraph issued an article "Don't ignore the technological value of the game industry".

As a composite cultural content product, games have both natural cultural attributes and profound technological attributes. Based on these two types of attributes, the game industry is also enriching its economic attributes, becoming a driver to support the integration and development of digital technology and real economy, and forming a "super digital scene". Game technology in recent years is realizing value spillover and releasing more effectiveness in chip, terminal, industry, construction and other real industry fields.

##### **(2) Strengthening Supervision: preventing minors from becoming addicted**

Since 2021, the state has taken corresponding policies and measures to prevent minors from being addicted to online games, and according to the Progress Report on the Protection of Minors in China's Game Industry 2022 jointly released by the Game Industry Committee of China Audio and Video Association, China Game Industry

Research Institute and Gamma Data in November 2022, the problem of minors being addicted to games has been further solved.

In the short term, there is a possibility of a small decline in the total number of users and hours of use, but in the long term it is expected to improve the competitiveness of product content consumption.

### **1.1.2 Supply side: the normalization of version number approval, the product is king logic interpretation**

Game license number is an important tool for game industry regulation and supervision, indicating that policy supervision is gradually entering normalization. Meanwhile, the normalization of license number issuance will further increase the supply of products in the market, and the logic of "product is king" is expected to be gradually realized and continuously interpreted in the future, which will eventually be reflected in the performance of the company. In addition, the recent progress of ChatGPT and other AIGC is expected to benefit the game industry as a downstream application, and AIGC is expected to promote the paradigm upgrade of game content production, achieve cost reduction and efficiency, and improve the playability and richness of game products. For example, NetEase's open-world martial arts hand game "Inverse Water Cold" announced the first game version of ChatGPT, which allows NPCs and game players to talk freely and give logical behavioral feedback independently based on the content of the conversation.

### **1.1.3 Demand side: the game market has entered the stock market, but the trading market is still promising**

The 2022 China Game Industry Report is out, officially released at the 2022 Annual Conference of China Game Industry. 2022, China's game user scale was 664 million people, down 0.33% year-on-year. Following the slowdown of user scale growth last year, this year also saw the first decline in user scale in nearly a decade. The factor of the decline is due to the impact of the new crown epidemic and the lack of new products, resulting in the loss of users, and the scale of China's game users has officially entered the era of the stock market.



The mobile game market, which is segmented in the game market, shows the same trend. 2022, the size of mobile game users in China reached about 654 million, down 0.23% year-on-year. The growth of mobile game user scale has stagnated.<sup>1</sup>



As an optional consumption, the game industry is characterized by fluctuations in the economic cycle, and since 2023, along with the optimization of China's anti-epidemic policy, the overall economic recovery has pushed the demand side of the game to warm up. The signal of warming demand also boosts the market confidence in the game industry.

The quantitative scale of game products has entered a high growth stage, and the coverage of games has been extended. In recent years, the overall market of online

<sup>1</sup> Data source: 游戏工委、伽马数据

game virtual goods trading has continued to maintain a growth trend. It has grown from 26.8 billion yuan in 2014 to 67.23 billion yuan in 2021.<sup>2</sup>



## 1.2 Pain Point Analysis

### 1.2.1 Playfulness

In the past, the idea of playing games was always associated with "not doing one's job" and "playing with things", and even today, there are still countless people who think that "playing games" itself is a very bad thing.

Although the current public opinion about e-sports is also starting to appear positive, for example, some people think that e-sports is an educational sport. There are also many online game studios established by professional players and game enthusiasts for the purpose of making money from the game, but more individual players have difficulty making gaming a profession like e-sports, so the pain point for this group of people is how to get enough to eat by playing the game as well.

They desperately need ways to turn the time and effort and even money invested in the game into income.

### 1.2.2 Price Discrepancy

The game asset trading market is not yet complete and still belongs to a blue ocean, many processes and rules are not yet perfect and there is no a unified standard. Therefore, the current transaction pricing is based on players' personal subjective judgment and is highly arbitrary. As a new buyer, you may do a lot of homework and lose money; as a seller with little experience, you may spend a lot of effort but make a

<sup>2</sup> data source: 智研瞻产业研究院

losing deal. Buyers and sellers who are not familiar with the game trading market are in urgent need of a fair pricing tool to price their game assets, so as to avoid the drawbacks brought by information asymmetry.

### **1.2.3 The king's wife sells the melon**

According to public information, in 2022, at least 70 investment and financing events occurred in the domestic game industry (the subject company or capitalist included Chinese companies), and 69 game companies got investments, compared with 153 times and 149 in 2021. Counting the undisclosed ones, the actual number will be higher.

It can be seen that the current investment and financing in the game industry is more cautious, the reason may have macroeconomic influence, but the uncertainty of game value is also the first reason.

When making investment and financing, it is better to evaluate the value of an enterprise or a business and hold a credible appraisal report to make the project stand out among many game projects and gain the favor of investors. At present, due to the incomplete information in the trading market, few enterprises evaluate game assets, and most of the evaluations conducted are done by traditional asset evaluation agencies, and as an emerging field, it is difficult to explain by traditional methods, and the professionalism is difficult to consider, and there is a great uncertainty in the relationship between the issued report and the real value.

Therefore, there is an urgent need for professional teams or tools to provide credible evaluation reports and create more investment and financing opportunities for both investors and financiers.

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## **Chapter 2 Solutions**

### **2.1 User Segmentation**

#### **2.1.1 C-side Users**

We provide pricing tools for individual game users with trading needs on the web and applet side, requiring them to input certain parameters (e.g. game name, game level, etc.) to provide a relatively fair price based on the current market situation, saving them the time spent searching for product prices on their own and determining the right price for the products they are interested in selling or buying.

2.1.2 B-side Users

(1) Game Trading Platform

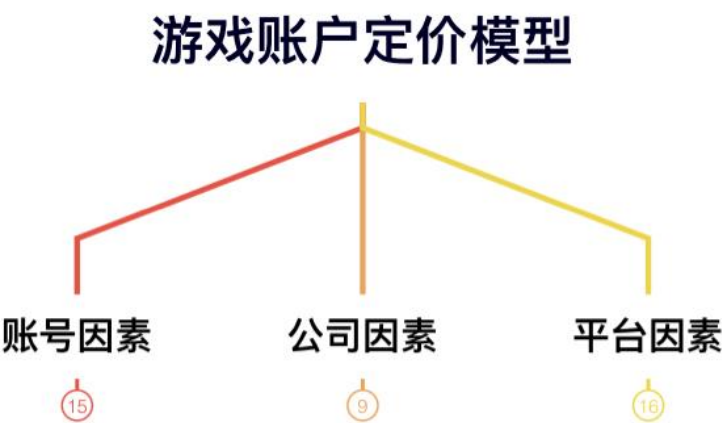
Provide pricing services for game trading platforms, with the platform providing transaction security guarantees to attract more users and speed up transaction rates.

(2) Game Companies

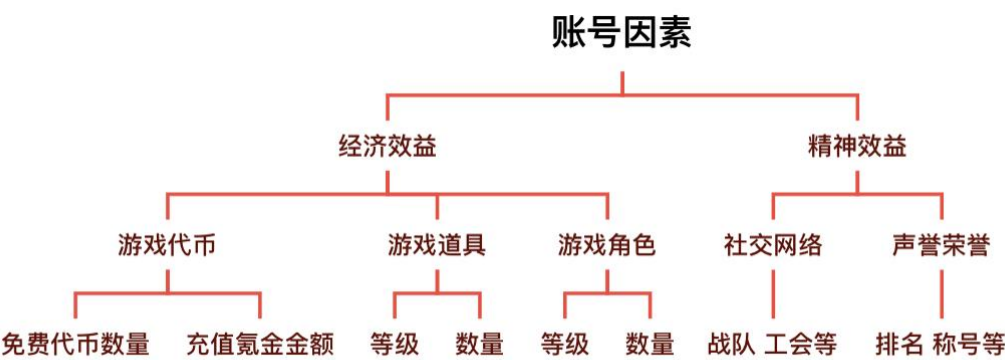
Measure the value of a game or the company operating behind it to support its investment and financing.

2.2 Product——Pricing Tool

Based on the AHP method, the following pricing model was determined:

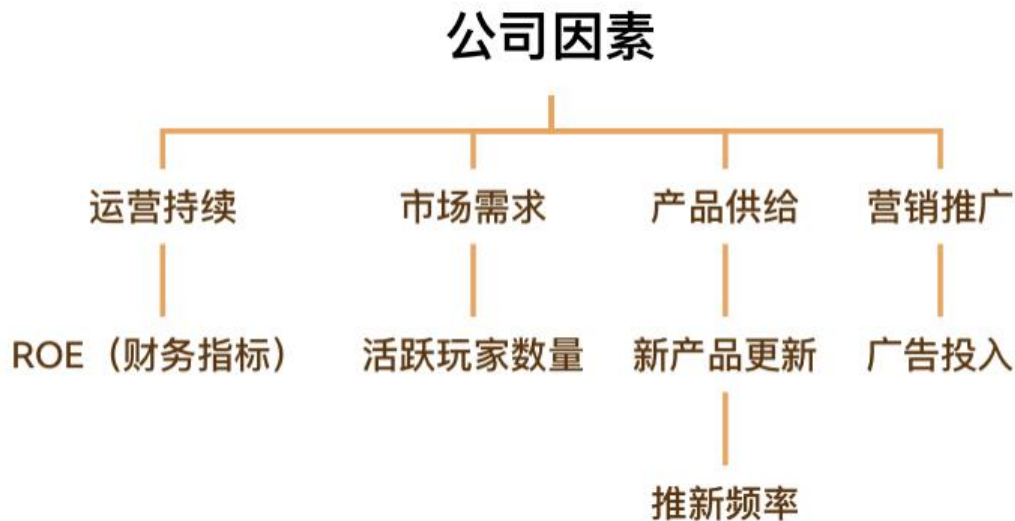


2.2.1 Account Factors



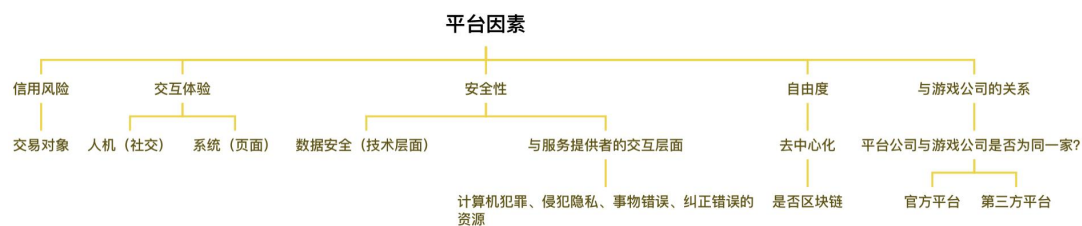
Referring to King & Wood Mallesons, the account factors are divided into economic and spiritual benefits.

2.2.2 Company Factors



Here the company refers to the game development and operation company, and this part of the index is mainly used to measure the future development of the game.

### 2.2.3 Platform Factors



The platform should not be used as an influencing factor of price, but due to the relative disorder of the current game trading market, the need for platforms to provide guarantees for transactions, and many other reasons, we believe that the platform factor needs to be included in the evaluation system when processing raw data as well as training models.

## 2.3 Technical Highlights

### 2.3.1 Deep reinforcement learning algorithms

Deep reinforcement learning algorithms such as DQN and DDPG are used to build neural network models. The models are used to serve the assessment more accurately and efficiently.

### 2.3.2 advanced and efficient python based web development framework

Flask development framework is used to improve development efficiency, save maintenance costs and better compatibility with neural network models.

## 2.4 Landing feasibility

#### **2.4.1 Resource feasibility**

Adequate data sources; reasonable human resource allocation

#### **2.4.2 Technical feasibility**

Jakob J. Korbel, in his article published in 'Journal of Theoretical and Applied Electronic Commerce Research', details his use of machine learning algorithms to obtain a virtual 3D asset price prediction. Therefore, we believe that a machine learning approach to identify virtual asset price prediction tools is feasible. And we will utilize more advanced deep learning methods, which we believe can improve the effectiveness of the tool.

#### **2.4.3 Economic feasibility**

##### **(1) Small running capital requirement**

Light asset model, low upfront investment costs, and the product only serves specific games (NetEase's Fifth Personality) in the early stage, with low upfront operation and maintenance costs.

##### **(2) Short period of economic benefits realization**

Once the tool is operational, we can reap the benefits immediately.

#### **2.4.4 Market feasibility**

The game asset trading market is currently in a disorderly state, although the security of the transaction may be guaranteed by the platform, the price is all determined by the players, which is more arbitrary, and the correlation between the transaction price and value is low, and there is an urgent need for fair pricing tools.

And due to the rapid development of the game market, the market for game asset trading is also unprecedentedly vast, and the market for pricing tools is a blue ocean.

### **2.5 Improvement options**

#### **2.5.1 Asset Pricing for Emerging Games**

The model relies on existing transaction information to train the model, and if it needs to price an emerging game, the lack of actual transaction data will not allow effective pricing.

Therefore, to improve the validity of the model, we need to speed up the rate of sample acquisition by first building a simple model using the existing data and then summarizing the model accuracy by acquiring more samples.

#### **2.5.2 Lagging of data**



Because the training data used for the model are historical data, the impact of black swan events such as company bankruptcy and trading scandals cannot be excluded; therefore, we hope to cooperate with major trading platforms in the later stage and use the form of interface to obtain new data directly; and pay attention to the fluctuations of the capital market, such as major transactions, equity swaps, betting agreements and other business activities, to obtain first-hand information and adjust the model in a timely manner.

### **2.5.3 Difficulty in forming a unified program**

Different games are highly individualized and specific variables are difficult to coordinate.

It is because of the strong individuality of the games that designing a model for each game independently is necessary. The workload is high but will effectively improve the accuracy of the model, and it seems to us that it is worth it.

## **Chapter 3 Business Model**

### **3.1 Business Model**

Attracted by the use value of game equipment, the demand and market for mutual exchange of weapons and equipment arise among players, and virtual items such as intangible game equipment are given value in the exchange. According to the difficulty and labor cost of players to obtain virtual items and their scarcity in the game, the prices of various game equipment are different. Since the game service providers do not advocate the transfer of game equipment for a fee, they are not involved in setting the price as the managers of the online game environment and order. Although the transaction price of game equipment is clearly marked on some websites, which can be used as value reference, it is self-defined by players and is arbitrary, and the essence is self-agreement between game players, which does not have objectivity.

Using deep learning technology to redefine and design a new game asset value assessment model, based on the AHP method, the system will automatically give a suggested reference value for game digital assets based on the same or similar assets in the blockchain, giving the most objective and fair value to game digital assets.

#### **3.1.1 Ecosystem**

### **(1) Data - participants, asset values, transaction records, community trajectories**

The participants are game asset owners, trading platforms, and purchasers.

Asset value is the transaction completion price, and when the market is orderly, the price fluctuates around the value.

Transaction record is the information related to this game asset transaction.

Community trajectory refers to the interaction data of participants while using the tool as well as the dwell data, etc.

### **(2) Equipment - web servers, intelligent terminals**

Devices are the databases that store data in the backend and the visual management in the frontend.

### **(3) Port - Web browser**

The product will initially be presented as a web page, which is light and fast.

### **(4) Services - evaluation, publication, inquiry, transaction, promotion, interaction**

A transaction is an action that a user can perform while utilizing a tool.

## **3.1.2 Technical Implementation**

The code is mainly implemented through Python, and the following figure is a partial code screenshot. The code is mainly implemented through Python, and the following figure is a partial code screenshot.



```
platform = 0
else:
    response_object = {'status': 'failed'}

account_item = [ssp_dress_sp_dress_dress_roles_retinue_ssp_goods_sp_goods_goods_head_head_frame_graffiti_waiting_action_purse_action_musi
account = Account(account_item)
pre = account.get_predict()
response_object['pre'] = pre
return jsonify(response_object)

if __name__ == '__main__':
    app.run()
```

## **3.2 Service Model**

It is generally believed that online game virtual goods trading can be mainly divided into two levels: one basic level; the other advanced level. Among them, the basic level belongs to the resource allocation within the game. In general, game players can use game coins or other game props to exchange with each other according to their needs. The game currency here is actually a game prop, so it has no

direct relationship with reality and only exists inside the game; the advanced level is built on the premise of the basic level. In other words, it is the real life trading of virtual items on the network. As the transaction at the basic level is limited by whether the game itself provides this function, it is difficult to control; therefore, the service provided by our team will be based on the offline transaction at the advanced level, i.e. buying virtual assets with legal tender in reality.

### **3.2.1 Valuing game assets for individual clients**

We provide pricing tools for individual game users with trading needs on the web and applet side, requiring them to input certain parameters (e.g. game name, game level, etc.) to provide a relatively fair price based on the current market situation, saving them the time spent searching for product prices on their own and determining the right price for the products they are interested in selling or buying.

### **3.2.2 Provide game asset pricing services for trading platforms**

In the current game asset trading model, game users play the role of sellers and buyers, and they trade virtual items that are normally obtained in the game and can be freely transferred, and for such game virtual items, buyers buy them through legal tender, which reflects a more market-oriented nature. In the current private sales model, basically all transactions are made through third-party trading platforms.

The platforms for trading game virtual assets can be divided into three categories, the first kind of consignment trading; the second kind of guaranteed trading; and the third kind of official cooperation trading.

Pricing on existing platforms is currently done by the seller, so there is a high degree of arbitrariness and the transaction cycle can be long.

Therefore, our team's pricing tool can provide pricing services for game trading platforms to attract more users and speed up the transaction rate.

### **3.2.3 Evaluate the overall value of the game for the game company to help financing**

Measure the value of a game or the company operating behind it to support its investment and financing.

## **3.3 Key Indicators**

### **3.3.1 Number of priced assets**

The front-end is run through the web side to get the number of times the tool is used.

### **3.3.2 Completion rate of priced assets (within one week / within one month)**

Later, we cooperate with the game trading platform to follow up the subsequent transactions of the priced assets, and use the number of assets completed for transactions on that platform over a period of time / the number of assets listed by players on that platform to obtain the transaction completion rate of the priced assets over a period of time, and effectively measure whether the pricing tool improves the efficiency of transactions.

### **3.3.3 User reuse rate**

We believe that users who recognize a tool will use it again, increasing retention.

In the first phase, the web side is used to obtain IPs, and in the later phase, the user IDs are added in cooperation with the game platform, and the number of old users/total users are used to determine the user reuse rate.

## **3.4 Competitive advantage/competitive barriers**

### **3.4.1 Cost advantage**

Data is obtained through crawler technology, and model training is conducted through deep learning with low human resource input. Later data collection can be automated, which may greatly reduce human resources cost.

### **3.4.2 First mover advantage**

The industry threshold gradually becomes lower, but the industry concentration is high, and the market has a certain degree of exclusivity. The future is data-driven, extending online services, high-frequency hitting low-frequency, and large commercial extensibility.

### **3.4.3 Network effects**

#### **(1) Supply-side economies of scale**

The use of the pricing tool facilitates the acquisition of more data to correct the model, thus making the tool more scientific.

#### **(2) Demand-side economies of scale**

Due to the development of the gaming industry, there are many potential scenarios applicable and a high degree of urgency in the demand for pricing tools.

The combination of the two forms a network effect with positive feedback to accelerate the closed loop.

## **3.5 Profit Model**

Pricing service revenue, divided into two pieces, provides pricing tools for game trading platforms and charges a fee based on the commission draw charged by game trading platforms to traders; provides pricing services for game companies on the game as a whole and charges a fee with reference to the volume of data.

## **Chapter 4 Case Application**

### **4.1 Case Introduction**

The Fifth Personality is produced by NetEase Asymmetrical Battle Arena (Asymmetrical Battle Arena) game developed by NetEase, the game opened on April 2, 2018 for limited testing and April 12 for full platform public testing.

Through the seven wheat data, get the ios end of the iPhone device nearly a year of the fifth personality download volume of 39.11 million people.

NetEase has launched an official trading platform, Zangbao Ge, to provide a platform for trading accounts of NetEase's games.

And Alibaba's Transaction Cat uses users' Alipay credit as a guarantee to provide a platform for products owned by a number of game companies such as Netease, Tencent and MihoYo.

Notice that whether it is an official or unofficial platform, the pricing of game assets is all done by players The arbitrariness of pricing determines the relative disorder and inefficiency of trading in the market.

Therefore, our team plans to provide pricing models for gaming assets to improve trading efficiency and enable prices to truly match value.

### **4.2 Model Refinement**

With reference to the characteristics of the Fifth Personality game, we refined the model proposed in the solution to improve targeting.

### **4.3 Data sources**

We selected the official platform: Netease Zangbao and the unofficial platform: Trading Cat as the data source.

### **4.4 Parameter setting**

It is mainly divided into three parts, related to the game asset itself, related to the trading platform and related to the game company, with a total of more than 20 parameters.

### **4.5 Pricing model results**

Due to the deep learning method, it is not possible to obtain the weights of each parameter, so the front-end page is shown here.



#### 4.6 Practical application scenarios

The first application scenario will focus on C-end individual users, providing price reference and accumulating data for their transactions.

In the later stage, we hope to cooperate with, for example, the platform of Zangbao Pavilion to provide pricing services for individual users' transactions in the platform and further improve the value chain of NetEase Games.

After accumulating some practical experience, we hope to provide asset pricing services for game companies similar to those provided by asset appraisal agencies, and provide a basis for them to use the game for investment and financing.

### Chapter 5 Project Status

#### 5.1 Team Members

Chaofan Ma, graduated from the School of Computer Science and Engineering at Nanjing University of Science and Technology, and then continued to study at the university. During his undergraduate years, he laid a solid foundation in computer theory, participated in the computer design competition for college students, the Industrial Bank Fintech Challenge, etc. He achieved excellent results. He now studies under Professor Cai Zhicheng, mainly researching cloud computing resource scheduling algorithms and cloud computing platforms, involving the application and research of professional knowledge such as software development and deep learning algorithms.

Berenice Wang, a 2021 master's student in School of Economics, Xiamen University, she got her bachelor degree in accounting. She won the silver award of Jiangsu Province in the "Challenge Cup" Entrepreneurship Plan Competition for Chinese College Students and the Silver Award in Fujian Province in the "Challenge Cup" Entrepreneurship Plan Competition for Chinese College Students in the past. She is currently involved in student work in the Student Union of the Faculty of Economics. She is good at financial analysis and asset valuation, solid financial knowledge, has internship in many well-known companies such as Accenture, EY, Deloitte, etc., with business perception and logical thinking ability, practical experience.

Liu Yiming studied finance at Minzu University of China and asset valuation at the School of Economics of Xiamen University. During his undergraduate period, he formed a group to participate in the GCCX project, a national innovation training project for college students, participated in social practice activities of the school for many times and won corresponding awards, and has rich practical experience.

Chen Jingze, graduated from Nanjing University of Technology with a bachelor's degree in Computer Science and Technology, and now I am studying Computer Science and Technology in the Department of Digital Media Technology at Xiamen University. During my college years, I have built a deep foundation in computer theory, won the second prize of Blue Bridge Cup, and achieved excellent academic results. During my graduate studies, I studied under Professor Junfeng Yao, and my main research interests are computer vision, digital twin technology, etc.

## **5.2 Project Progress**

Now, deep learning technology has been used to complete the model construction, complete the connection with the front-end page, pass the test, and put into use.

It is planned to use tools to collect tens of thousands of primary data in the next six months, and use primary data to revise the model.

It is planned to try to cooperate with the game asset trading platform in the next year to help it extend the industry chain and obtain more first-hand data.

In the next two years, based on cooperation, obtain a transaction data of other games (1-2 models, currently selected as Tencent's Honor of Kings), and provide pricing tools for other game training models.

### **5.3 Project originality**

#### **5.3.1 There are no similar competing products in the project creative market**

According to the results of market research, the current game market pricing tools are limited to blockchain games, and non-blockchain games do not yet have excellent pricing tools.

#### **5.3.2 Core code can be detected by antiplag's professional code check**

Ensure the complete originality of the product.

#### **5.3.3 Project patents can be applied for at the same time**

After the tool is completed, patent applications can be made to secure intellectual property rights.

## **Chapter 6 Market Environment and Industry Analysis**

### **6.1 Market Environment Analysis**

#### **6.1.1 Policy Factors**

The game industry has achieved a healthy, stable and benign operation under the key attention of the state. As a digital economy industry deployed by the state, the development of online games and other digital cultural products is in a golden period. 2021, when presiding over the 34th collective study of the Political Bureau of the CPC Central Committee on promoting the healthy development of China's digital economy, General Secretary Xi Jinping emphasized that "digital economy is the future direction of global development, and innovation is the key to the development of digital economy ". In the "14th Five-Year Plan" cultural industry development plan also stressed the need to promote the high-quality development of cultural industries, the implementation of the digital strategy of cultural industries, the launch of more digital cultural products with the Internet, mobile terminals and other carriers, and promote the integration of e-sports and games and amusement industry development. Development to enjoy the dividends, but also to take responsibility. The Propaganda Department of the Central Committee of the Communist Party of China said in the Notice on Comprehensive Governance in the Field of Cultural and Entertainment issued in September last year that it would strengthen comprehensive governance in the field of cultural and entertainment, enhance game content auditing and gate-keeping, improve the cultural connotation of games, and require the advancement of anti-addiction system access and perfect real-name verification



technology. In April 2022, the General Office of the State Council issued the "On Further Releasing Consumption Potential to Promote Sustainable Recovery of Consumption Opinions", from the perspective of systematically and comprehensively promoting consumption, put forward 20 key initiatives in 5 aspects, in which cloud games were clearly written into the planning regulations such as standard development. A series of policies and regulations related to the development of games such as data security, user privacy, and healthy games for minors have been introduced by various ministries one after another and actively implemented by all parties in the industry, further standardizing the ecology of the game industry and ensuring the healthy operation of the mobile game market.

### **6.1.2 Economic Factors**

In 2022, in the face of the stormy international environment and the arduous and heavy task of domestic reform, development and stability, the national economy resisted the pressure and continued to develop, with the total economic volume reaching a new level and the overall stability of employment and prices. The annual gross domestic product was 121 trillion yuan, an increase of 3.0% over the previous year. The tertiary industry added value of 64 trillion yuan, an increase of 2.3%. The annual per capita disposable income of the nation's residents was 37,000 yuan, a nominal increase of 5.0% over the previous year. With the development of China's economy and the continuous improvement of people's living standards, spiritual and cultural life is becoming an important part of people's growing need for a better life, and games, as an important variety of spiritual and cultural consumption, will surely usher in greater development space.

Currently, due to the epidemic and other factors, despite the rise of the "house economy", the development of China's game market has been hampered, with sales revenue and user scale declining year-on-year. The overall operation of China's game industry shows that: the impact of the new crown epidemic is serious, a number of market indicators have declined significantly, and the industry is in the stage of pressure accumulation; the level of industry health norms continues to improve, the protection of minors is more in-depth, and the effectiveness of anti-addiction work appears; game enterprises actively expand overseas markets and face fierce competition from international counterparts; game technology continues to innovate and develop, and its spillover effect is beneficial to the integration of digital reality;

game The products focus on Chinese cultural connotation and highlight innovation and creativity; the "game +" mode is multi-directional radiation, and the cross-domain and cross-border help transform and upgrade the industry. How to find a new way out of the game under the declining scale has become an urgent problem for the current game industry to be solved.

### **6.1.3 Social factors**

The development of the gaming industry is highly dependent on the development of Internet technology, the construction of national network infrastructure and the development of network terminal operation equipment. 2022, the total length of China's fiber optic cable lines reached 59.58 million kilometers, the number of Internet broadband access ports reached 1.071 billion, the number of 10G PON ports with gigabit network service capacity reached 15.23 million, the national cell phone and Internet penetration rate respectively The penetration rate of mobile phone and Internet reached 119.2 per 100 people and 74.4% respectively. By the end of 2022, 2,312,000 of the completed mobile communication base stations in China were 5G network base stations, accounting for 21.3% of the total number of mobile base stations, representing an increase of 7 percentage points from the end of the previous year. As the scale of China's 5G Internet mobile user group takes initial shape, the domestic mobile Internet industry begins to gradually enter the 5G era, which will provide a more fluid Internet development environment for the development of the game industry and offer more possibilities for industrial development.

Due to the improvement of domestic Internet technology development level, perfect Internet infrastructure construction and national economic income level, the scale of China's network and mobile game user group has been expanding. Since 2008 to 2022, the number of domestic game users has grown at a compound annual growth rate of 16.52%, so the domestic game industry has been able to have a rapid growth period of more than ten years.

In addition, the new regulation of anti-addiction for minors, which was officially implemented in China in 2021, has brought certain obstacles to the growth of the user scale of the game industry while promoting the healthy and rational development of the age structure and consumption structure of domestic game users, so the scale of the domestic game user group in 2022 has shrunk by 0.33% year-on-year, and the dividend of industrial user growth has almost disappeared, which brings new

challenges to the development of game enterprises. In 2022, the actual sales revenue of Chinese game market was 265.884 billion yuan, down by 30.629 billion yuan or 10.33% year-on-year. The scale of game users was 664 million people, down 0.33% year-on-year. Following the slowdown of user scale growth last year, the user scale also declined for the first time in nearly ten years this year. In the era of stock scale, the growth of game scale again may depend on technical innovation.

#### **6.1.4 Technological Factors**

Game technology is a technology cluster that is first applied on a large scale in video games to enrich and enhance the human interaction experience as the main goal. Because of its technical features such as interactivity, high simulation, strong immersion and real-time rendering, games are gradually being applied to many fields of social economy and become an important technical toolbox to promote the development of digital-real integration. It takes computers and electronic devices derived from computers (game hosts, cell phones, AR/VR devices, etc.) as carriers and tools, computer language and algorithm design, computer graphics, hardware and software architecture, network debugging and adaptation, interactive (input and output) devices, etc. as the main areas, mainly serving the development and operation and maintenance of video games, and is an important part of the digital technology system.

Currently, the game industry is facing technical changes. The traditional game industry is based on the centralized data storage structure under HTTP protocol. Domestically, online games use a centralized server to process and store data, which is directly expressed in the game: the game rules are made by the game vendor, which can arbitrarily change, create and destroy any content in the game. The game site is provided by the vendor, and players depend on the site provided by the vendor. The game account exists on the game vendor's server, which is not owned by the game player and the ownership belongs to the game vendor. Game props are bound to a certain game account, which is also dependent on the vendor's server and cannot be transferred. Thus, it can be seen that in the centralized game ecosystem, game players are highly dependent on game factories. At present, domestic game assets are completely dependent on the centralized game system, and different games form independent virtual economies, and the game props purchased in the game do not have any value once they are separated from the system, and even the game props of

Android and iOS systems are not common. These game assets can only be traded by the game system mandatory regulations, part of the game assets can not be traded, part of the game can only invest money and can not extract assets.

In the decentralized blockchain technology system, players will have all the property rights of virtual assets, and developers or game manufacturers will not be able to change the game accounts at will. Due to the continuous change of technology, game practitioners seek greater breakthroughs in the field of technology. Virtual reality VR breaks the limitation of screen experience and allows users to experience the virtual world immersively, while AR takes reality as the main background and integrates real scenes with props in the virtual world. In addition, blockchain technology has injected new elements into the game industry. With the development of various technologies such as blockchain technology, AI, interaction technology and Internet of Things, the rise of the meta-universe concept is supported by the virtual reality industry driven by VR and AR. As a hot topic nowadays, the meta-universe concept has triggered extensive attention from many industries and capitals, and some of the game enterprises in China have started to lay out the meta-universe.

Due to the current stock size of the traditional game market and the rise and development of metaverse games, the trading of virtual assets such as game accounts and props will become more and more frequent, and with the use of blockchain technology and the increase of users' willingness to pay, the demand for trading of game assets is becoming more and more diversified.

#### **6.1.5 Legal factors**

Online game accounts belong to the category of virtual property, and up to now, we still have not introduced laws and regulations on the protection and transaction of virtual property, only in Article 127 of the General Principles of the Civil Law, which stipulates that if the law has provisions on the protection of data and network virtual property, it shall be in accordance with its provisions. However, there is no law that specifically provides for the protection of network virtual property, so it is very general and vague. There is no unified and strict definition of virtual property in the theoretical circles, and the general theory is that it is property with property value and exists in cyberspace in the form of electromagnetic data.

In terms of administrative regulations, the Ministry of Culture's Measures for the Administration of Online Games (repealed on July 23, 2019) clearly stipulates that

online game virtual currency issuance and trading practices shall not provide trading services for minors, and shall not provide trading services for online games that have not been reviewed or filed. In the past two years, although there has been a movement to amend and then promulgate the Measures for the Administration of Online Games, it has been delayed and it is understood that it does not involve provisions concerning the prohibition of trading in online game accounts and props. The Notice of the Ministry of Culture and the Ministry of Commerce on Strengthening the Management of Online Game Virtual Currency clearly stipulates the regulation of virtual currency issuance and trading behavior to prevent the market risk of online game virtual currency trading. The Notice of the Ministry of Culture on Regulating the Operation of Online Games and Strengthening the Supervision Work afterwards clearly stipulates that virtual props of online games are managed in accordance with the relevant regulations of virtual currency. The above regulations mostly restrict the issuance and trading of game virtual currencies, but more from the perspective of issuance, the purpose is to prevent virtual currencies from constituting an impact on the real financial and monetary system, but they do not prohibit the trading of virtual properties between game operators and game players, nor are they considered illegal and invalid. The Notice on Preventing the Risk of Crypto Virtual Currency and the Notice on Preventing the Risk of Token Issuance and Financing define tokens and virtual currency, a specific type of online virtual property, as "specific virtual goods" or "virtual currency" from the perspective of financial supervision. "However, it does not deny the tradability of game accounts and props itself. According to the basic principle of civil law that "no prohibition is allowed", both online and offline trading of game accounts and props are carried out normally, which objectively provides a relaxed and good development environment for the development of game accounts and props trading industry.

In July 2020, the Supreme People's Court and the National Development and Reform Commission jointly issued the Opinions on Providing Judicial Services and Protection for Accelerating the Improvement of the Socialist Market Economy System in the New Era, which clearly proposed to strengthen the protection of new types of rights and interests such as online virtual property, digital currency and data, and give full play to the value of judicial adjudication on the protection of property rights.

## **6.2 Industry Analysis**

### **6.2.1 Game asset trading market development**

The earliest origin of online games is in the United States, along with the Internet technology, the game industry in China emerged at the end of the last century, online games are gradually known and understood by the public, and experienced the initial development stage, and now has begun to form a stable development mechanism, under the market economy environment has also achieved rapid development, creating a large amount of income, and more and more groups have joined the online game player team.

And driven by the rapid development of the game market, the game virtual asset trading market has also risen. Virtual assets are non-physical items exchanged in virtual scenes or non-physical fields. Currently, the main virtual goods include electronic vouchers, in-game virtual currencies and items, accounts, gift cards, membership cards and gift certificates, which can be used to exchange virtual goods to provide products and services. It mainly includes 1) identity category, including game accounts, game roles, game qualifications, etc. 2) props category, including game equipment, game props, game currencies and other issues. The number of online game players is amazing, and they are more and more familiar with the sale and purchase of various game virtual properties, some "RMB players" may invest millions or tens of millions of yuan to buy game props, upgrade and fight monsters, and the transfer of game accounts and props has become a realistic option for them to realize after their accounts are idle and they don't want to play. Game virtual assets trading has now developed into a huge industry chain.

The development of game virtual trading can be divided into three stages, which are birth period, development period and future prospect period.

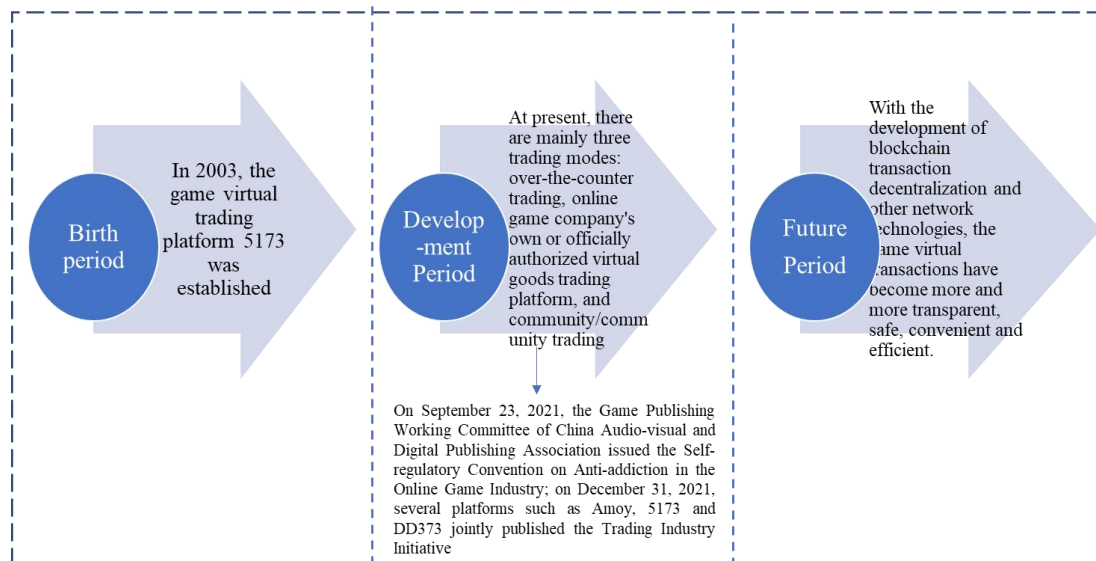


Figure : Game industry development

Birth period: game trading was born along with the emergence of online games. The trading of game virtual assets was produced in endgame seventeen. When online game users withdraw from the game, the account idle will make the initial investment wasted, and account trading can get certain return to reduce the investment loss, so online game account trading has become a strong demand for many players. 2003, game virtual trading platform 5173 was established, specializing in providing users with virtual asset trading services. Development period: three trading modes have been existing, but the transaction specification needs further improvement. At present, virtual asset trading mainly includes over-the-counter trading, company-owned or authorized trading platform, and community/community trading mode. 2021 On September 23, the Game Publishing Working Committee of China Audio-visual and Digital Publishing Association issued the Self-regulatory Convention on Anti-addiction in Online Game Industry, emphasizing that game enterprises and small game platforms should resolutely implement real-name authentication, and must fully access the National Press and Publication Administration's online game anti-addiction It emphasizes that game enterprises and mini-game platforms should resolutely implement real-name authentication, and must fully access the real-name verification system of the State Press and Publication Administration for online games, and put forward higher requirements on the accuracy of user identification, and encourage game enterprises to actively explore the use of face recognition and other means for identity verification. On December 13, 2021, several platforms, such as Amoy, 5173

and DD373, jointly published the "Trading Industry Initiative", advocating game trading enterprises to jointly fulfill the obligations of honest and law-abiding operation, strengthen responsibility, implement real-name authentication, standardize trading behavior, fulfill platform responsibility, and improve trading safety. The initiative advocates that game trading enterprises should jointly fulfill the obligations of honest and lawful operation, strengthen responsibility, implement real-name authentication, standardize trading behavior, fulfill platform responsibility and improve trading safety. Under the background of the implementation of real-name authentication and the importance of minors' protection, the game virtual trading is expected to be safer and more transparent: however, the industry currently lacks clear regulations and legislation on the trading of game virtual goods, and the legal attributes of game virtual goods are still controversial, so the standardization needs to be further improved. Future outlook period: With the development of blockchain transaction decentralization and other network technologies, game virtual transactions will tend to be transparent, safe and standardized, and the market and user scale are expected to reach a new level.

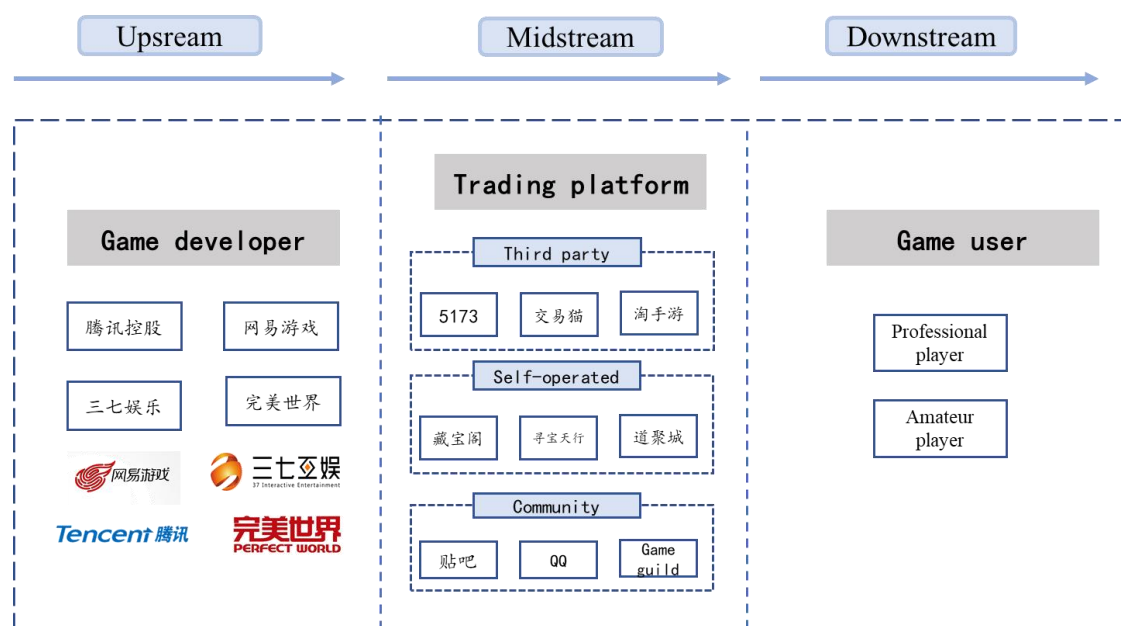


Figure : Game Industry Chain

The upstream of game virtual asset trading is game content suppliers, game operators and other game enterprises, the midstream is game virtual trading platform, and the downstream is game users. Among them, game users can be divided into professional game players and amateur game players.



The demand for virtual property trading has arisen at the beginning of the design of online games, and the scale of virtual property trading is increasing. Since the end game to hand game, account trading industry has existed for more than twenty years, and after more than twenty years of development, there are enterprises engaged in online game account trading such as transfer (Tencent investment), 5173, 8868, 7881, uu898, Amoyou, magic tour, trading tiger, G buy and sell, 17uoo, 4931, vv881, etc. There are also more and more players who are more and more conscious to participate in the game virtual assets Trading, the game from pure entertainment attributes slowly to the direction of both entertainment and trading attributes. At present, the online game account trading market is huge in scale, and presents a variety of commercial trading places and modes such as third-party trading platforms, game manufacturers' own platforms, game built-in trading systems and forums/communities.

### **6.2.2 Game asset trading market status and scale**

In 2022, the global game market size will be about 200 billion USD and the user size will be about 3.2 billion people. The rapid development of China's game industry, its share in the global game market has gradually expanded, and the revenue of China's game market has maintained a rapid growth trend in recent years, and the increase of paying users and the improvement of paying ability have continuously promoted the rapid development of the game industry. At present, the market size of China's game market is 265.884 billion yuan and the user size is about 664 million people, occupying an important position in the global game industry pattern with about one-fifth of the number of players and about one-seventh of the market size in the world. In the past decade, China's game industry has continued to show a stepwise growth. The demographic dividend brought by the Internet provided the first stage of support for the growth of game users, with 670 million Chinese game users in 2021, an increase of 957%; the market size of China's game industry is 296.513 billion yuan. the actual sales revenue of China's game market in 2021 increased by 17.826 billion yuan compared with that in 2020, an increase of 6.40% year-on-year. It continues to maintain a relatively stable growth rate. The scale of China's game users officially entered the era of stock market.

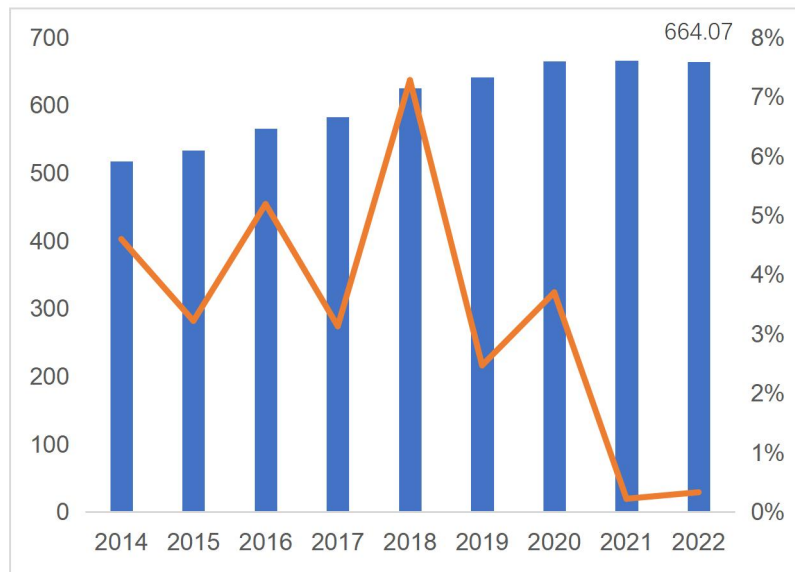


Figure: Scale of game users in China (million RMB)

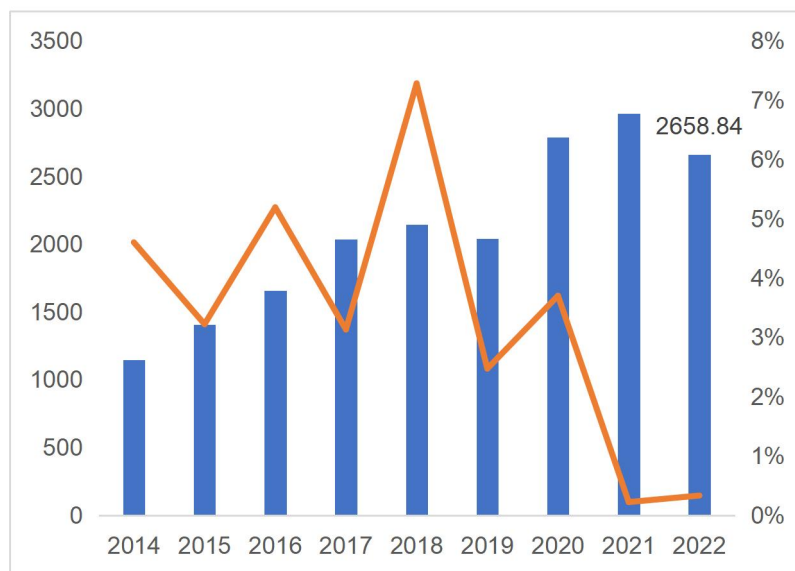


Figure: Actual sales revenue of Chinese game market (100million RMB)

The development of China's game market was hampered by the epidemic and other factors in 2022, with sales revenue and user size decreasing year-on-year. The actual sales revenue of mobile games decreased, and the actual sales revenue of mobile game market accounted for 72.61% of the total revenue. It is lower than the share of mobile games in 2021 (76.06%). However, mobile games are still the main force in the revenue of Chinese game market.

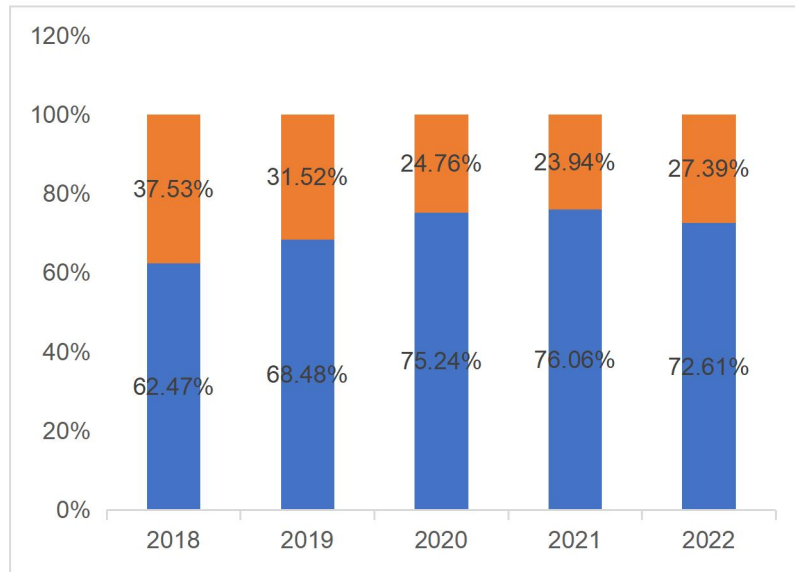


Figure: Percentage of actual sales revenue of games by terminal in China's game market

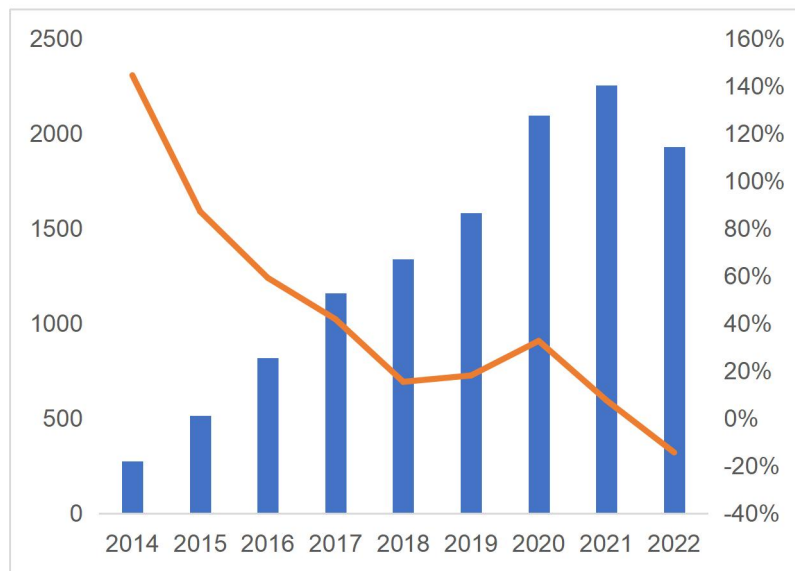


Figure: Actual sales revenue of China's mobile game market(100million RMB)

Against the background of the general decline of user scale, overall revenue and game revenue on each platform in China's game market, the actual sales revenue of client-side games still keeps growing. From the perspective of platforms, the multi-end concurrency of games becomes a trend, and client-side games become the only revenue growth type. 23.08% of the client-side game market in 2022, up from 19.83% last year. The actual sales revenue of client-side game market was \$613.73, up 4.38% year-on-year. The total revenue of the top ten client-side games in terms of revenue, accounting for 48.16%. In the past three years, the actual sales revenue of

the client-side game market has been growing year by year, which is especially bright in the background of the overall industry downturn.

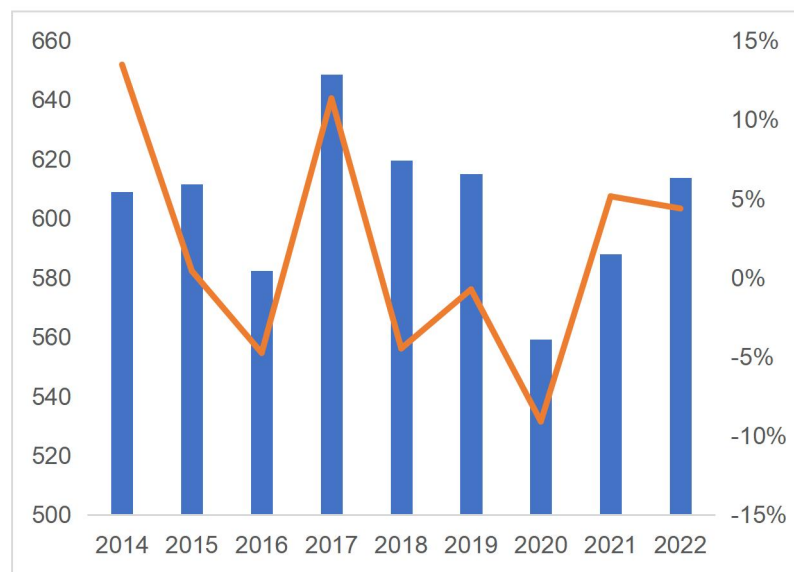


Figure: Actual sales revenue of client games in China(100million RMB)

Looking at the global game virtual trading market, the global virtual item trading shows a significant growth trend from USD 19.16 billion in 2014 to USD 38.82 billion in 2020. Along with the establishment of centralized trading platforms, the global virtual item (game) trading market will continue to expand in the future.

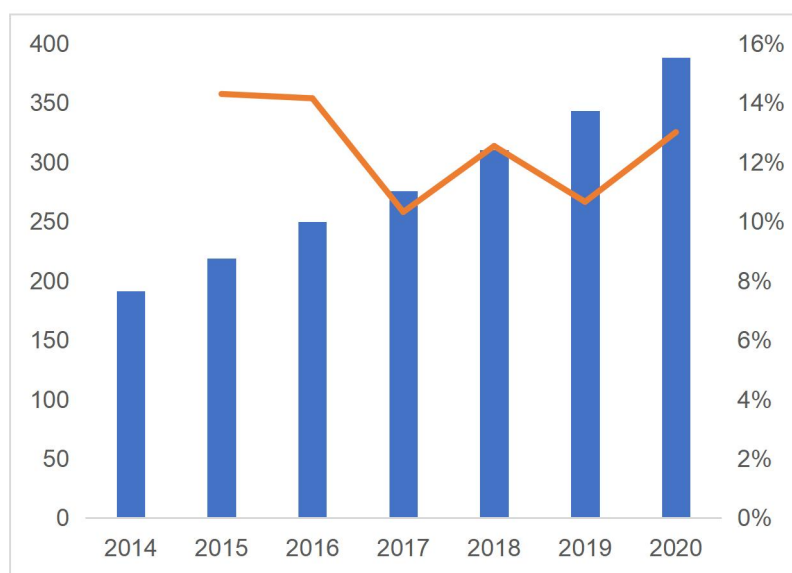


Figure: Global game virtual trading market size and growth rate(100 million RMB) <sup>3</sup>

Looking at the domestic game virtual trading market, China's game virtual goods trading market is large and growing fast. According to statistics, the market scale of

<sup>3</sup>Data source: Huajing Industry Research Institute

game virtual items in China reached 63.58 billion yuan in 2020, with a year-on-year growth of 15.7% and a CAGR of 15.5% from 2014 to 2020, which is in a steady rising stage.

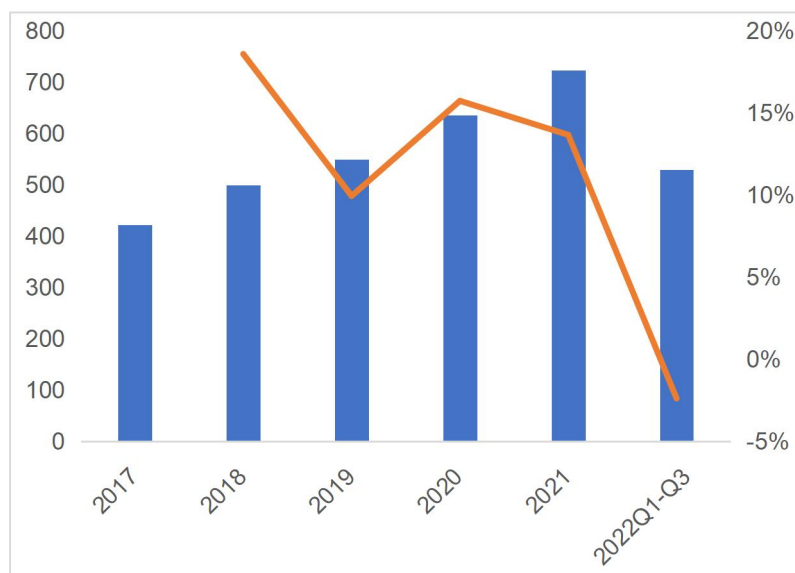


Figure: Chinese Game Virtual Goods Trading Market Size and Growth Rate(100 million RMB) <sup>4</sup>

### 6.2.3 Game asset trading market competitive dynamics

The game industry is divided into 3 competitive echelons based on the revenue of game-related business. Among them, companies with game related business revenue of more than 50 billion include Tencent Holdings and Netease, of which Tencent Games, a subsidiary of Tencent Holdings, will achieve revenue of 156.1 billion yuan in 2020; companies with game related business revenue of 10-50 billion yuan include Sanji Mutual Entertainment and Century Huatong; companies with game related business of less than 10 billion include Perfect World, Youzu Network, Jibit, Giant Network, Palm Fun Technology, Hero Mutual Entertainment, etc.

<sup>4</sup>数据来源: Data source: Zhiyanzhan Industry Research Institute

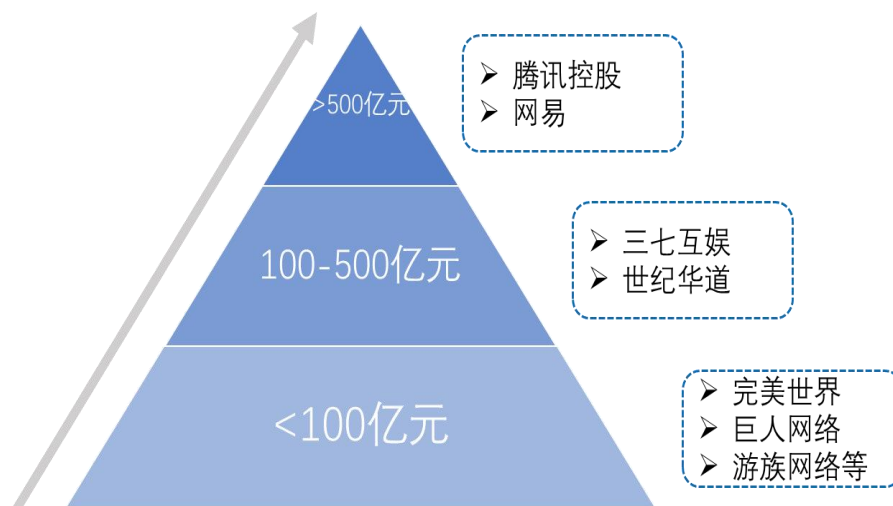


Figure: Competition in the game industry

According to the China Audio and Digital Association Game Industry Committee and Gamma data show that the market size of China's game industry in 2020 was 278.687 billion yuan, of which the operating income of Tencent Holdings game business accounted for 56.01% of the market size of China's games, is now a veritable leader in China's game industry; followed by Netease's Netease game accounted for 19.59% of the market size of China's game industry, the rest The market share of the company's game business is less than 10%.

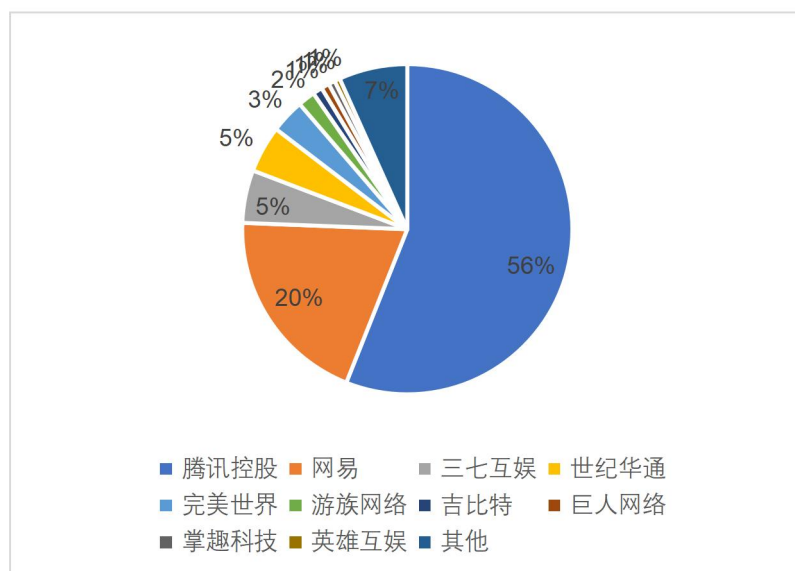


Figure: Chinese game industry market share (game business revenue)<sup>5</sup>

<sup>5</sup> Data source: China Audio and Digital Association Game Industry Committee, Gamma data, company annual reports

In addition, the online game virtual property trading market mainly has the following three trading modes, and the main competing companies are: mode one, over-the-counter trading, such as 5173, trading cat, Amoy, magic tour, Stmbuy, Taobao, Jingdong and other large third-party game virtual goods trading platform or comprehensive e-commerce platform, all of which can trade game accounts, props and equipment; mode two, online game companies carry out off-game Self-run or set up officially authorized and recognized virtual goods trading platform, such as Netease Treasure Pavilion, Perfect World Treasure Hunting, Tencent's Daojucheng, Cool Tour Network, Xingyue Club public number, etc.; mode three, community/community trading. Such as Baidu posting bar, QQ group, WeChat group and various game guilds exist some groups of game players. Usually, some studios or small companies establish or join some relevant groups that gather a large number of game players, and the group members conduct game virtual property transactions privately based on trust. Various game guilds may also organize game players to trade game accounts and props in communities and communities.

#### **6.2.4 Game asset trading market segmentation**

The types of game transactions from the Chinese virtual goods trading market can be divided into the client-side market and the mobile-side market. Most of the transactions are mainly focused on client-side games. Mainly because: First, the client-side game industry started earlier and has formed a relatively mature and stable market operation mechanism. Years of game behavior cultivation and user accumulation have formed a high degree of user stickiness and good user payment habits, making a large number of high-quality virtual goods trading players concentrated in the client-side game market. Second: the production quality of client-side games is high, and many in-game systems such as economic system, social system and war system are considered at the beginning of end-game planning. When the number of tradable goods in a game market continues to rise and can meet the game demands of all kinds of players, the transaction scale of the game market will naturally remain above a high level. Analyzing from a longer time, since 2014, the revenue of client-side game market has always fluctuated above and below 60 billion yuan, with a maximum range of about 5 billion yuan. Therefore, the future growth space of client-side game market still needs more powerful and excellent products and more wonderful user experience to expand.

At present, cell phone mobile games in the process of development and improvement, but also continue to learn and learn from the mature development experience of client-side games. All the eye-catching hand games on the market have achieved a monthly revenue of 100 million yuan, and hand game players have the same strong consumption ability as client game players. With the intensification of handheld games, the number of tradable virtual items and account transactions in the game will explode, and the scale of handheld virtual item transactions will also rise. At that time, mobile game virtual goods trading will become an important growth point of China's virtual goods trading market.

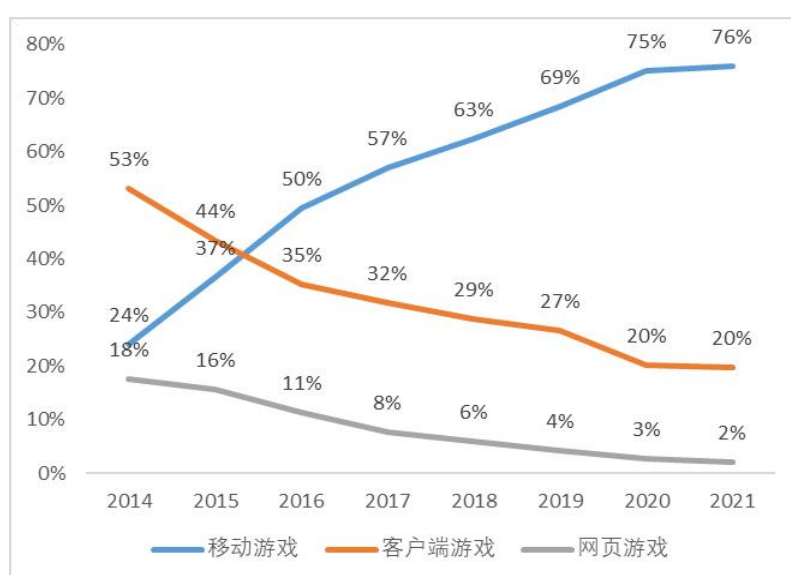


Figure: Market share changes of three major market segments of Chinese games <sup>6</sup>

### 6.2.5 Future development and challenges of game asset trading market

The metaverse concept is exploding in 2021, and many game makers are using metaverse as a selling point for their games. 2021 is the "year of metaverse", and the metaverse industry will become an important part of China's digital economy in the future. According to Sullivan, in 2021, China's metaverse game market size reached 79.07 billion yuan, still in its infancy; the future market is expected to increase significantly, with a compound annual growth rate of 40.4% from 2021 to 2026. In the future, with the further development of blockchain transactions decentralization and other network technologies, virtual property transactions will become more and more transparent, safe, convenient and efficient, and the scale of users joining virtual property transactions will further increase. And with the popularity and development

<sup>6</sup> Source: Foresight Industry Research Institute



of game products such as game gaming industry, and the lonely generation after 90 and 00 becoming the mainstream player group, the transaction scale of game virtual goods/services market will still increase significantly.

With the technological iteration of the game industry and the rise of meta-border games brought by blockchain and virtual reality technologies, the multifaceted integration of games is obvious, and thus the demand for trading of game assets supported by different technologies is becoming more and more diversified. In this complex combination of background, for the innovative development of games, whether traditional games or metaverse games relying on blockchain technology, the demand for downstream end users to trade virtual assets is very necessary. However, the existing game asset trading platform lacks unified and fair pricing standards, and the blockchain technology-backed meta-games also need to support the corresponding game asset trading rules and pricing standards. How to help game asset trading platforms and game operators serve downstream users with different backgrounds and technical support, and formulate reasonable and fair pricing strategies will be the challenge point of game virtual asset trading industry in the future.

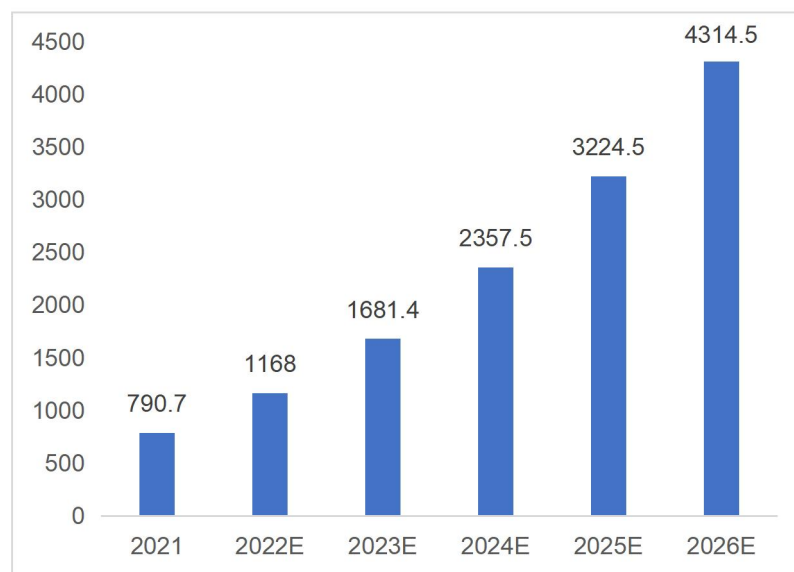


Figure : Chinese Metaverse Games Market Size and Forecast (\$ billion) <sup>7</sup>

## Chapter 7 Marketing and Promotion Strategy

### 7.1 Price Strategy

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<sup>7</sup> Data source: 2022 Metaverse Game Development Insight White Paper

Appropriate incremental service fees include: e-commerce, video streaming, advertising services, paid email and other value-added services. As part of our overall marketing strategy, we need to use a variety of online and traditional sales and marketing programs and promotions to build our brand for our pricing services. We need to build awareness through online marketing campaigns, aggressive PR campaigns and other offline advertising.

Content and pricing services are generally offered through mobile applications or their respective websites: partner trading platforms, game providers purchase our pricing services at predetermined package rates or on a per-project basis, and individual users who trade game assets and use the pricing services are required to register with the website and pay a percentage of the service fee when they generate a transaction to use the pricing services.

We rely on a number of copyrights, trademarks, patents and trade secrets to protect our intellectual property. Employees are required to sign all necessary documents to give our work product the sole and exclusive right to do so. Transfers to other service providers are subject to a royalty fee.

## **7.2 Marketing Team**

We need to set up a suitable marketing team to collect internal intelligence of the rival in time, establish a good relationship with the internal staff of the rival or its subordinate customers, and communicate frequently, so as to establish a feedback system of promotional competition information. In addition to develop a reasonable and suitable marketing strategy to understand the details of the terminal dynamics. Actively establish a good relationship with partners to enhance customer stickiness. At the same time for the single game asset trading user promotions, use reasonable promotional materials and marketing tools to attract new users.

## **7.3 Marketing Channels**

### **7.3.1 Use scenario analysis**

The scenario of using this tool is mainly when users have the demand of selling or buying game assets, so placing and waking up users in the scenario when they have the demand of trading is the most funny promotion method, the scenario is when customers click into the trading website or search relevant keywords in the browser or software.

As an Internet-dependent tool, our placement will focus on online, and we need to consider the activity trajectory and psychological needs of the target users, so we consider placing social media and fission pulling.

At present, we only analyze the promotion plan for the product introduction period.

At this stage, users do not yet understand what the tool is used for and what benefits it has for them, so the promotion goal at this stage is to explain the purpose of the tool.

### 7.3.2 Promotion Program

We need to invest in a series of marketing campaigns with larger investment platforms and gaming vendors to further strengthen our brand image and continue to expand our user base, including with leading social media, video and live streaming platforms to promote our services to a wider potential user base.

We engage users through a variety of channels, such as our sponsored search, social and online advertising, Internet video and television advertising, and other advertising channels. We also provide our customers with eye-catching game information and game transaction content for our promotions, and we strive to expand our reach to attract more visitors.

The logic of the promotion is:

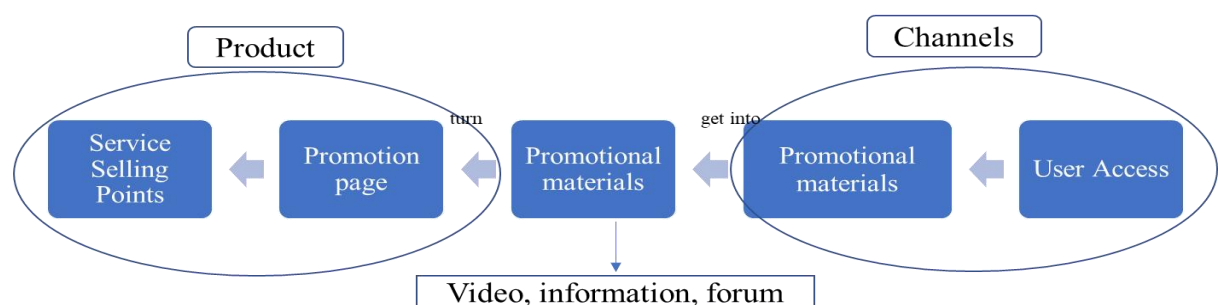


Figure: Promotion Logic

We need to develop new marketing channels including:

- Baidu search, searching through search engines.
- User research, understanding users and discovering channels.
- Partners, nested promotion by partners.
- The creation of offline theme activities and salons to attract game trading users to participate more, more communication, brainstorming.

### (1) Community Promotion

The promotion strategy is: you need to establish community groups and forums on the web side of data asset pricing, and set up novel information about the latest domestic and foreign game information and game trading information to attract more potential game virtual asset trading users.

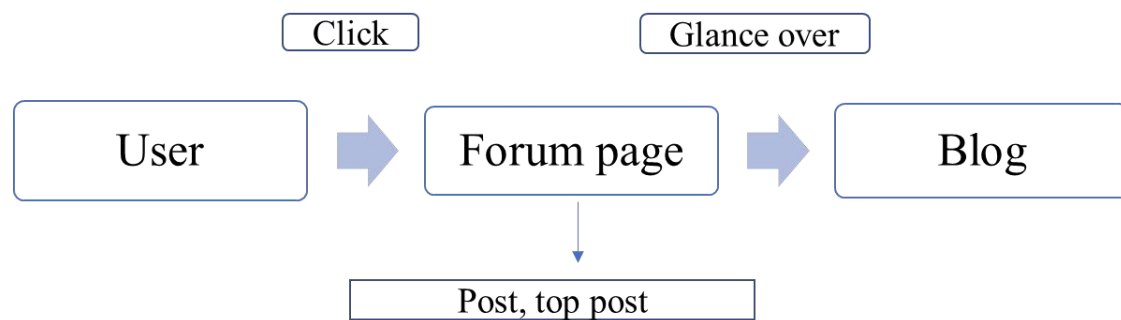


Figure: Promotion Strategy

### (2) Placement of effect ads

Bring users in search to relevant keywords such as: account for sale, account purchase, SEM advertising, the use of search engines to promote.

### (3) Placement of brand advertising

The ads are placed on the game trading platform page, the main content is how to use the tool, click on the ads to jump to the use case page for further information.

## 7.4 Promotion Tools

We need to focus on providing better services, products and experiences to our users through a holistic analysis of big data innovations and a deeper understanding of them. Based on technology that can process and analyze the massive amount of data generated by millions of users in real time, the data analytics capabilities needed include: content, relationship and behavioral data based on user activity and interaction, allowing us to create a more accurate user profile. Based on this data, we can provide a more intuitive and comprehensive picture of our users' interests and preferences, and provide valuable user reference data for R&D, marketing, user engagement and other strategic initiatives. Our big data analytics capabilities allow us to conduct comprehensive analysis and make timely adjustments to the services and products we offer.

## Chapter 8 Financial Analysis

### 8.1 Cost Analysis

There is no cost in the early stage of the project, and all data are obtained by crawling.

The cost after the project is formally put into operation is divided into the following parts.

#### 8.1.1 Technology cost

Cloud server \$600-1500/year

Domain name 80 RMB/year

#### 8.1.2 Labor cost

1 year: 1 maintenance staff + 1 data engineer at 200,000/year/person

2 years: 1 maintenance staff + 2 data engineers at 200,000/year/person

3-5 years: 2 maintenance staff + 3 data engineers at 200,000/year/person

#### 8.1.3 Data cost

Later consider to continue to use the crawler way + cooperation with the platform. Therefore data cost will be conservatively estimated.

Table : cost sheet

Year	1	2	3	4	5
Technology cost / million RMB	0.1	0.1	0.1	0.1	0.1
Labor cost / million RMB	40	60	100	100	100
Data cost / million RMB	5	10	15	20	25
Total cost / million RMB	45.1	70.1	115.1	120.1	125.1

### 8.2 Revenue Analysis

The revenue is divided into B-side and C-side revenue with reference to the classification model of users and services. The project will focus on providing services for C-side users and trading platforms in the first 5 years, and the services provided for C-side users are unpaid.

Table: revenue sheet

Year		1	2	3	4	5
Number of games/pc		1	3	5	10	20
C-side revenue / million yuan		0	0	0	0	0
B-side revenue / million yuan	Trading Platforms	50	150	250	500	1000
	Game Company	0	0	0	100	200
Total revenue / million		50	150	250	600	1200

### 8.3 Profit Analysis

As you can see, the profit margin is increasing year by year and the project has great potential for future development.

Table: profit sheet

Year	1	2	3	4	5
Revenue / million	50	150	250	600	1200
Cost / million	45.1	70.1	115.1	120.1	125.1
Profit / million	4.9	79.9	134.9	479.9	1074.9
Profitability	10%	53%	54%	80%	90%

## Chapter 9 Project Risk Management

### 9.1 Internal Risk Factors

#### 9.1.1 Managing Risk

Our success will depend in large part on our ability to recruit and retain middle and senior management. Subsequent changes in our management team could result in significant disruptions to our business. We also depend on the ability of technical, editorial, marketing and customer service personnel with relevant skills, particularly experienced online game software developers.

We need to recruit motivated and strong engineers, game designers, product developers and creative professionals of all types, especially those who are deeply involved in the gaming field and have sufficient experience with various game value points, as well as appraisers with asset valuation expertise and capabilities, and network engineers who can perform relevant pricing product design to design,

evaluate, run, and display game virtual asset pricing results. How to recruit, attract and train such talents and provide reasonable career development prospects and a good working environment to retain such talents will be a great test for us and a potential risk for the Company. There can be no assurance that any person hired in the future will be successfully integrated into our team or will ultimately make a positive contribution to the business.

#### **9.1.2 Financial Risk**

We need to develop sound accounting policies for financial reporting risk management, such as financial reporting management policies, budget management policies, cash management policies, financial statement preparation policies, and finance department and employee management policies. Procedures and information technology systems need to be developed to implement the accounting policies and the finance department needs to review the management accounts in accordance with these procedures. We also need to provide regular training to our Finance staff to ensure that they understand our financial management and accounting policies and implement them in our daily operations.

#### **9.1.3 Operation Risk**

Risks associated with the asset pricing operations of our partner operators:

- Risks related to possible incompatibilities with respect to the need to update valuation models for new online games and uniform pricing for existing online games

Risks related to possible policy restrictions on the virtual assets traded by our partner game operators and trading platforms

- Risks associated with the uncertainty of obtaining approval for game assets such as game tokens

Risks associated with the international operation of our online gaming services

- Risks associated with partnering with third-party trading platforms

Risks associated with maintaining pricing copyrights or intellectual property rights for our existing game assets

#### **9.1.4 Data Security Risks**

Because of the need to collect information about game users in the course of pricing game assets, we face claims for damages if our information technology systems are breached, including the existence of security breaches and improper

access or disclosure of our or our users' data, which could have a material adverse effect on our reputation, results of operations and financial condition.

If the security of our information technology systems is not up to par, it could have a material adverse effect on game operators and could result in improper disclosure of personal information and other data. We rely on our information technology systems to record and monitor the purchase and consumption of virtual props by most of our game players and share certain personal information about our customers, such as their names, addresses, telephone numbers and transaction records, with contracted third-party game companies or trading platforms. In addition, we have accumulated a large amount of data, including information about our customers' browsing and spending behavior, and customer service information. Hackers can design and distribute computer viruses, worms, and other malicious software programs that can cause information to be compromised and affect our reputation.

We continue to invest significant resources in system security, information encryption and other security measures to protect our systems and data, but these measures may not provide absolute security. If our systems are vulnerable, our data about our game players' virtual prop purchases and spending, as well as other personal information about our users, such as users of our smart learning and e-commerce products, may be at risk. As a result, our transactional experience from our game users could be materially and adversely affected. This could have a material adverse effect on our business, results of operations and financial condition.

## **9.2 External Risk Factors**

### **9.2.1 Economic Risk**

Our business, financial condition and results of operations depend in part on the continued growth of the online gaming industry in China and the continued growth of other markets in which we have published games, particularly in Asia Pacific and North America.

(particularly in Asia Pacific and North America). The online gaming industry is affected by a number of factors beyond our control, including.

- general economic conditions and the level of player disposability for non-immediate goods, such as the purchase of in-game virtual props.



- the availability and popularity of other forms of interactive entertainment, particularly console games, which are more popular in North America, Europe and Japan but which we have only recently begun to develop.
- the availability of reliable telecommunications and Internet infrastructure and adequate server bandwidth in the markets in which we operate
- evolving computer, smartphone and tablet technology.

There can be no assurance that the online gaming industry will continue to grow over time or that it will continue to grow at any given rate

### **9.2.2 Social Risks**

The novel coronavirus (COVID-19) has been spreading around the world. Governments around the world have implemented measures to control the spread of COVID-19, including travel restrictions and bans, directing residents to follow social distance guidelines, quarantine advisories, homeownership orders and the closure of non-essential businesses. Although the COVID-19 vaccine has been approved in several countries, there is no assurance of the long-term safety or efficacy of the vaccine, or of the effectiveness of existing vaccines against the novel coronavirus variant that causes COVID-19.

The outbreak has caused and may continue to cause us and certain of our business partners, including game licensees, suppliers, customers, advertisers and manufacturers, to make temporary, permanent adjustments to work schedules to allow employees to work from home. We have taken steps to mitigate the impact of the outbreak, including monitoring the health of our employees and optimizing our technology systems to support the potential increase in gamer traffic. However, our and our business partners' efficiency and productivity may still be reduced, which may adversely affect the quality of our services.

### **9.2.3 Competitive Risk**

Our customers are mainly from global online game developers and operators (such as Tencent), product providers and virtual asset trading platforms, and game users who have a need to trade virtual assets in games. Although there are three major types of virtual item trading platforms for virtual trading of game assets, no provider or platform has considered officially setting a uniform and reasonable pricing for game assets. There will still be potential competitors, such as game operators and game asset trading platforms love to design and provide game asset pricing services

with the advantage of their scale, and may further develop or acquire content and services to compete with us. The areas in which we compete include, among others

We make reasonable valuation of game users' accounts based on the level, props and other information of game war numbers provided by game users to solve information asymmetry and promote effective operation of game asset trading market. However, there is a group of strategists within game companies and operators who understand better how the game works and how props function can advance game asset pricing with the help of the platform, which will expose us, as a third-party game asset pricing service provider to the threat of potential competitors.

#### **9.2.4 Innovation Risk**

We continue to devote significant resources to innovating and exploring new product pricing, as well as pricing services and technologies, to meet the rapidly changing customer needs and trends in the Internet industry. However, the success of new products and services depends on many factors, including the quality of our products or services, the acceptance of our target customers, and our assessment of market needs and trends.

In addition, our partners, gaming operators and third-party trading platforms, are constantly developing innovative products for mobile devices and personal computers to enhance the user experience in the areas in which we currently operate or in new areas where we wish to expand our business. As a result, our efforts to continue to innovate and explore new growth strategies, and to introduce new products and services to attract more customers to our services, may not keep pace with the pace at which operators are updating their gaming services, and there can be no assurance that our efforts to innovate will have a positive financial impact.