

# Blockchain in Online Games and What Can Be Learned from It

Liming Xiao<sup>1, a</sup>

<sup>1</sup>School of Economics and Management, South China Normal University, Guangzhou, 516622, China

<sup>a</sup>20190732039@m.scnu.edu.cn

**Abstract:** In recent years, with the booming development of Internet technology, the types of online game products and gameplay have become more and more diversified, and the market size and revenue of the world's online games have shown a steady growth trend. In the formation of a perfect industrial chain and high entry threshold at the same time, due to the over-centralized management, can not meet the expectations of the user community, resulting in low user stickiness, the number of users to grow into a bottleneck situation. Blockchain technology has the unique value of decentralization, data security and credible transaction, which can effectively solve the pain points of online games and become a new direction for traditional online games to break through the development bottleneck. By deconstructing the existing specific cases of successful combination of blockchain technology and online games, this paper elaborates the realization path of successful application of blockchain technology in online games, and analyzes in detail the core logic of successful combination and mutual adaptation of blockchain technology and online game industry, which is committed to providing useful guidance for future related research.

**Keywords:** Blockchain technology, online games, decentralization, digital cryptography.

## 1. Introduction

### 1.1. Background and significance of the study

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The application of blockchain technology to the gaming industry is a necessity, and between the birth of blockchain, a brand new concept, and now, more and more industries have benefited from it. The important role of blockchain technology for the game industry is that part of the game process is built on a distributed network, that is, the blockchain network. The game data needs to be verified by multiple nodes, which ensures that the game mechanism is absolutely transparent, and players can perform any operation on their virtual assets at any time.

Blockchain games have the following three characteristics:

The first point is decentralization. If the traditional game is managed and controlled by the game company, then the regional chain game can not only remove the control of the game company, but also allow players to have more control in the game. This decentralized feature makes the regional chain game more fair and transparent.

The second point is traceability and non-tampering. Each operation in the area chain game will be written in the block chain, which means that each operation of the player can be traced by others. Meanwhile, due to the non-tamperability of the blockchain, no one can modify the data that has been written into the blockchain, which fundamentally avoids tampering with the results of the game and ensures the fairness of the game.

The third point is player autonomy and control. As a decentralized game mode, region chain games give players more control. Players can independently decide which region to enter and which players to play with, and they can also participate in voting and control the operation of the game.

Relying on the booming development of Internet technology, the development of the scale of the online game industry is also soaring. With the fire of Bitcoin, blockchain

technology has gradually received attention from all walks of life, and financial institutions and government departments in various countries are actively researching and exploring the application scenarios of blockchain technology.

#### 1.1.2. Significance of the study

The development of the online game industry is rapidly changing, and blockchain technology is also emerging with the growing popularity of digital cryptocurrencies such as Bitcoin. As the demographic dividend diminishes, the scale growth trend of the domestic online game market is beginning to stabilize, and competition within the industry is beginning to intensify, requiring new breakthrough points. Blockchain technology is a new decentralized infrastructure and distributed computing paradigm, and this feature points out a new possibility for the operation of online games. On the other hand, blockchain technology's information disclosure and non-tamperability are highly compatible with the transaction requirements of virtual goods in online games, which is especially suitable for building programmable monetary system, financial system and even macro social system. Therefore, researching and exploring the integration and application of blockchain technology and online games is an important topic of common concern in the industry.

By deconstructing the existing specific cases of successful combination of blockchain technology and online games, this paper describes the realization path of successful application of blockchain technology in online games, and analyzes in detail the core logic of successful combination of blockchain technology and online game industry and phased adaptation, which is committed to providing useful guidance for future related research.

## 1.2. Literature review

Research on the application of blockchain technology in online games at home and abroad is divided into three dimensions: first, the feasibility analysis of the application of blockchain technology in online games. On the premise that blockchain technology can be combined with online games,

researchers at home and abroad also summarize the advantages of the combination of the two, including high interactivity, high privacy, and a stronger sense of gameplay. The second is to study the positive impact of the combination of blockchain technology and online game industry. The researcher clarifies how the rise of blockchain technology has positively revolutionized the game industry from four aspects: the cooperation and distribution of game developers, the core idea of blockchain, the change of blockchain to the game world, and the reward system for players. Third, it is the research on the production design based on the technical system at the bottom of the blockchain. For example, Jinan of Beijing Aqiyi Technology Co., Ltd. based on the characteristics and application field of blockchain technology.

In order to address the existing pain points of the game ecosystem at this stage, a blockchain game ecosystem framework based on the improved PBFT algorithm is constructed. M. Xu Shizhen and Li Wei constructed a decentralized game asset trading platform by utilizing the data blocks<sup>[1]</sup>, P2P data transmission technology, and cryptography in the blockchain technological system in order to address the existing problems of the game asset trading platform.

In summary, only very few researchers at home and abroad have explored the application of blockchain technology in online game products and industries from the perspective of specific successful cases of combining blockchain technology with online games. At the same time, there is also very little literature studying the realization path and core logic of how blockchain technology is successfully applied in online games<sup>[2]</sup>.

## **2. 2 Application of Blockchain Technology in Online Games**

### **2.1. 2.1 Overview of applications**

There are many successful cases of combining blockchain technology with online games. In November 2017, Crypto Kitties, the world's first cat-raising game based on blockchain technology, was launched on Ether. The game facilitated more than 12 million RMB in transactions in less than a week, and a total of 280,000 virtual pet cats were sold in 3 months, setting a record for transactions with a unit price of more than 700,000 RMB. Roblox is a massively-multiplayer online sandbox game creation platform, which provides players with a rich library of materials and powerful editing features to support their digital content creation. Roblox has become one of the world's largest multiplayer online game creation platforms, with more than 40 million games covering various genres such as shooting, fighting, survival and racing. King Digital Entertainment, the developer of Candy Saga, which has begun using blockchain technology to protect its intellectual property. King Digital Entertainment uses blockchain technology to record virtual items in its games and ensure that they cannot be copied or pirated.

### **2.2. Cases of Successful Combination of Blockchain Technology and Online Games**

#### **2.2.1. Blockchain games based on Ethereum (piggybacking on blockchain technology)**

Crypto Kitties: the world's first collection game powered by blockchain technology, still stable in the top three Ether games. Crypto Kitties is a blockchain-based pet raising game that includes birthing, collecting, buying, and selling cats,

also known by the aliases Cloud Jerking Cats and Cloud Raising Cats. Users can buy, breed, sell, and collect virtual cats that have unique attributes: eye shape, eye color, hair pattern, tail type, belly hair, eyebrows, mouth, chin, whiskers, and expression. Each crypto-cat is a non-homogenized token (NFT) and each NFT is unique and can therefore be used as a collectible or investment.

#### **2.2.2. Focused Chain Tour Introduction "Axie Infinity"**

Before entering the game, players will need to purchase three pets called "Axie" for virtual currency (which now costs several hundred dollars at the cheapest) and use them to breed and get new Axies, but instead of purchasing them from AxieInfinity or Sky Mavis, the newcomers will buy them directly from the player. purchased directly from players, "who can sell tickets to this universe to others."

"Crab offers two in-game tokens: Smooth Love Potions (SLP) and Axie Infinity Shards (AXS). The former can be earned by playing the game, while the latter is a governance token that gives players the power to vote on key decisions in the game. Players enter the game by purchasing Axie NFTs and are required to propagate Axie by consuming the native tokens SLP and AXS. The key to player profitability is to obtain SLPs and AXS through Axie battles to propagate Axie for trading, as well as through secondary market premium trading of the tokens themselves and pledge of the tokens to make profits.

The game is designed to be played by battling for tokens, buying or breeding new Axies in the marketplace, and trading for profit. Existing players can breed new Axies from existing Axies, each Axie can be bred up to 7 times and cannot be inbred, requiring 4 AXS (Axie Infinity Shards) plus an ever-increasing amount of SLP (Smooth Love Potion) to control the rate of Axie production and slow down inflation.

## **3. The Core Logic of The Successful Application of Blockchain Technology in Online Games**

### **3.1. Why use blockchain in games**

#### **3.1.1. Unique business model and irreplaceable virtual currency**

##### **(1) NFT**

NFT is a non-homogenized currency, an application of blockchain technology. In the game, NFT based on blockchain technology is able to record the player's status and achievements within the game, and save the list of items acquired in the game, such as weapons, movies, vehicles, characters, etc. NFT can also be used for in-game transactions, where players can use NFT to make transactions with cash or other virtual currencies. In addition, NFT can also be used for in-game transactions, where players can use NFT to make transactions instead of using cash or other virtual currencies.

##### **(2) Play To Earn:**

The majority of in-game revenue no longer goes to large, centralized game companies, but to good players. By participating in the in-game economy, players can create value for other players and developers. In turn, players can be rewarded with in-game assets. These digital assets can be any crypto asset that is corroborated on the blockchain. P2E focuses more on maximizing player involvement than profit.

Blockchain technology gives players ownership of in-game assets and allows them to increase their value by actively playing the game, where players are creating value for other

players and developers. In turn, they are rewarded with in-game assets. These digital assets can be any crypto asset that is corroborated on the blockchain, which is why the P2E model is a great match for blockchain gaming.

### **3.1.2. Blockchain opens up a new model for the gaming industry**

Blockchain gaming is a perfect new model, a new era unique to the gaming industry. Developers will no longer have the authority to manipulate players' property at will, and some sensitive game data and rules will not be hidden from users, because everyone can go to the blockchain browser to view the relevant game data records. Blockchain games can make vision-based gaming possible. They present alternative growth mechanisms that have the potential to scale to millions of users without being platform-dependent[3]. Blockchain can also allow new types of games (new mechanics and gameplay) to become possible.

## **3.2. Analysis of reasons for user buy-in**

### **3.2.1. Through decentralization, players directly obtain property rights to virtual assets**

The majority of in-game revenue no longer goes to large, centralized game companies, but to good players. By participating in the in-game economy, players can create value for other players and developers. In turn, players can be rewarded with in-game assets. These digital assets can be any crypto asset that is corroborated on the blockchain. P2E focuses more on maximizing player involvement than profit.

### **3.2.2. Blockchain Technology Ensures Security of Players' Virtual Assets**

Blockchain is an interconnected internet that relies on mathematical algorithms and intelligent machines to build secure and trustworthy data storage, transmission and interaction. Blockchain does not rely on a central management node and is capable of realizing distributed recording, storage and updating of data. At the same time, it can record virtual items in the game, record all transactions within the game, and these transactions are not tamperable. And it ensures that these items will not be copied or pirated.

In blockchain technology, digital encryption technology is its key point, generally utilizing asymmetric encryption algorithms, that is, the password when encrypting is different from the password when unlocking. To put it simply, we have an exclusive private key, as long as we protect our private key, give the public key to the other party, the other party encrypts the file with the public key to generate the cipher text, and then passes the cipher text to you, and then we decrypt with the private key to get the plain text, we will be able to guarantee that the contents of the transmission will not be seen by others, and the encrypted data will be transmitted. At the same time, there is also a digital signature for us to add another layer of protection, used to prove that the file sent to the other party in the process has not been tampered with.

### **3.2.3. User Stickiness Direction**

DeFi Farming (DeFi Yield Farming) is the process of depositing cryptocurrencies into the DeFi protocol in order to generate revenue. Users can earn revenue by depositing cryptocurrencies into a liquidity pool to provide liquidity to that liquidity pool. This return can be fixed or variable and is usually paid out in the form of cryptocurrency. Utilizing DeFi's Farming solves part of the problem of attracting traffic upfront. Some players will be attracted to the game because of the revenue, or some people who were not originally

players will be attracted because of the revenue (which may or may not convert to players). Games are not purely financial gambles, and NFT makes Farming inherently free of liquidity floods, but only if the game's playability and mechanics attract a steady stream of players<sup>[4]</sup>; if players keep dropping off, NFT is meaningless. Farming proceeds help improve the game's player retention rate in an attempt to address the problem of over-exploiting players in F2P games.

## **4. Shortcomings and Implications**

### **4.1. Shortcomings of Blockchain MMOs**

#### **4.1.1. The player base is still small**

Not to mention the 3 billion players of traditional games, the user base of GameFi is still very small compared with that of DeFi. In the era when hand games occupy an important market, most of the chain games are still mainly page games which seem to be a bit "simple", which makes players who have long been accustomed to hand games return to the web site even less.

#### **4.1.2. Congestion and high transaction fees**

Due to the high performance requirements of the game, it makes frequent transactions also have high requirements for the network's transaction speed TPS (Transactions Per Second) and Gas fee. Therefore, it makes many players out of the blockchain game.

#### **4.1.3. Poor playability and lack of stickiness**

Even the most popular GameFi program is still very single compared to traditional 3A games, and in order to catch up with the heat of the market, it constantly incorporates many games of varying quality, which is more like a mobility mining program with a good-looking skin. Players who really love the game will not be attracted to come, but more "workers" to make money for the purpose of entering.

### **4.2. Future outlook on the application of blockchain technology in online games**

With the development of 3D digital content manufacturing technology and the maturity of related VR, AR hardware and software technology, it is expected that games will become one of the main forms of presentation of blockchain applications. The game industry has made active attempts in various aspects such as finer visual effects, virtual world construction, automated generation, user-autonomous creation, and socialization mode, and user creation and socialization platforms such as Roblox have already appeared. It is expected that the industry will continue to innovate and evolve in categories such as open worlds, UGC platforms, socialization games, and virtual currencies, and a large number of 3A-grade chained games will be born in the following years, and the types of games will also be further expanded to RPGs, competitive games, and other fields. It is expected that the industry will continue to innovate and evolve in categories such as open world, UGC platform, social games and virtual currency.

## **References**

- [1] Xu, S., Li, W. (2019) Research on game asset trading platform based on blockchain. *Computing Technology and Automation*, 2019 (38):151-156 .
- [2] He J. (2018) Outlook of blockchain technology application in online game industry *Business Economy*, 07:63-65.

- [3] Zyskind, G., Nathan, O., Pentland, A.S. (2015) Decentralizing privacy: Using blockchain to protect personal data. Proceedings of the 2015 IEEE Security and Privacy Workshops (SPW2015).
- [4] Bai, J., Du, Y. (2021) A blockchain-based data mining framework for sensitive information in large-scale social online games. Journal of Xi'an University of Technology, 37(03):397-402.