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RESEARCH ARTICLE

Market Value Appraisal of Virtual Property From A Chinese Legal Perspective

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ABSTRACT

With the rapid development and popularisation of the Internet, online games have become more than just a tool for entertainment. People can build social relationships through online games, trade through virtual property in online games, for example, in the game named Counter Strike, the players have the ability to trade the weapons' skins they've obtained by playing the game on the game's official marketplace using the real currency. At the same time, crimes against virtual property in online games have also become more and more rampant. China faces the difficulty of not being able to appraise the value of virtual property when combating crimes violating virtual property in online games, this leads to difficulties in identifying the amount of crime. This article adopts a qualitative approach, which is mainly theoretical research. This article explores the sources of value of different kinds of online game virtual property, and identifies the difficulties faced in appraisal of the value of virtual property in online games. It proposes to construct diversified ways of appraising the value of virtual property in online games, and to use electronic forensic examination technology to link virtual property in online games with the relevant behaviours of network users in reality, which can help to reasonably appraise the value of online game virtual property.

1. INTRODUCTION

After entering the 21st century with the further development of science and technology, Internet technology has penetrated into people's daily life, virtual network technology has created huge wealth for mankind, but also make the human life has undergone a radical change. At the same time, the new crown epidemic ravaged the traditional offline entertainment gradually disappeared, more and more people chose the online entertainment, the most important one is the online game(W. Li, 2022). At the same time, with the change of people's consumption concept, online games have become a part of people's life, more and more people pay a lot of time and money in online games, and online games have even become a part of many people's works, so people pay more and more attention to the virtual property in online games. Online game virtual property is a new form of property existence in online games, which has been widely discussed since its birth. Online game virtual property refers to the virtual items, currencies, accounts, etc. created or obtained by players in online games. Although these virtual properties exist in the digital environment, they have real value for players(Pollitzer, 2007).

With the popularity of online games, the number of offences against virtual property in online games is also increasing(L. Wang et al., 2023). One of the keys to crime control is the determination of the market value of virtual property in online games, which in turn determines the amount of money involved in the offence and helps the procuratorate and the courts to convict and sentence criminal suspects. However, there has not yet been a uniform way of determining the value of virtual property in Chinese judicial practice, which has led to the existence of different decisions in the same or similar

cases, with large differences in the convictions and sentences handed down by the courts in respect of such offences(Huang et al., 2023). It should be recognised, however, that there are many types of online game virtual property, and that different types of online game virtual property have different acquisition methods, tradability and other properties, and that the market value of online game virtual property should not be determined in a value determination manner(Zheng et al., 2020). In order to determine the value of online game virtual property in criminal offences, this paper considers that the ways of acquiring exchange value should be analysed in the light of the source of value of different types of online game virtual property, and ways of quantifying its market value should be further explored.

LITERATURE REVIEW

Concept and classification of virtual property in online games.

Virtual property is a kind of data resource, which has actual value in the virtual network and can be regarded as a kind of virtual items. Professor Yang Lixin believes that the essence of virtual property is a kind of electromagnetic record that exists in the virtual world and can be used to determine the value by applying the existing property evaluation standards, which can be seen as an affirmation of its property attributes(L. X. Yang & Wang, 2004). Online game virtual property is one of the types of game resources, including props, tokens, characters and accounts, that exist in the game space environment and can be traded and are at the disposal of game players. Although game virtual property also belongs to the category of virtual property, it is limited to the scope of the game, and therefore has its special characteristics. Professor Peng Xiaohui and Professor Zhang Guangzhong define virtual property from the perspective of illegal acquisition of virtual property, which may bear criminal or civil liability depending on the degree, and the act of acquiring other people's virtual property without lawful means belongs to the act of illegally intruding into and acquiring Internet users' information in criminal law, and the act of illegally acquiring, collecting and processing citizens' personal information in civil law, and analysing the virtual property from the perspective of this viewpoint. The essence is a kind of personal information(Peng & Zhang, 2004). Professor Cui Changzhen is based on the scope of online games, that network virtual property has the dependence on the game running platform, all game players in the process of the game operation can be independently dominated and controlled by the account number, props, virtual currency and so on belong to the network virtual property(Cui, 2006).

Classification of virtual property in online games.

Hu Xinhua and Jiao Yubing classify virtual property in online games into three categories: first, the medium connecting virtual space and real space, i.e., the game account of online game consumers. The second is the general equivalent that can make payment transactions in online games, i.e. the virtual currency in the game. In order to distinguish it from digital virtual currencies such as bitcoin, this paper refers to the virtual currency in online games as virtual tokens. The third is the game props that satisfy the game needs of online game consumers, such as characters, weapons, equipment, skins, etc. in the game(Hu & Jiao, 2020). The determination of the value of different types of online game virtual property should take into account the characteristics of each type of virtual property.

Game Account. Online game, also known as online game, refers to a form of game in which the process of playing requires connecting the game operator's server and the user's computer through the public Internet, and using the game client software to interact with the information(Espina & Lapates, 2017). A game account is the electronic ID of a gamer in the game world, through which the gamer can log in to enter the online game world and receive various services provided by the game operator. Gaming accounts are usually given a mobile phone number, email address or a combination of 8-16 Arabic numerals as the account name, and the password is set by the user. In order to differentiate between different players, the account name is usually a unique combination, and one of the values of the game account lies in the account name itself, i.e., there are rare accounts made up of special combinations of numbers, which are often traded at a high price based on the number itself. The true value of a gaming account is the storage space it holds on the web server and the web products that are attached to or stored on the storage space of the web server. The account name of a gaming account is like the house number and the password is like the key to the house, and the true value of the house lies in the property placed in the house, not in the house number or key.

Virtual Token. Virtual tokens in an online game are virtual exchange instruments in the form of electromagnetic records that are issued by the game operator and expressed in digital units. Users can purchase or exchange these tokens for a specific percentage of legal tender and store them on servers provided by the game operator. These virtual tokens can be exchanged for online game services provided by the enterprise, usually in the form of prepaid top-up cards, points or amounts, and do not include items such as props obtained through game activities, and the virtual tokens can also be exchanged for game props, game currency or other value-added services. There is no unified virtual token in China's network environment, but rather different network operators issue their own exclusive virtual tokens in the platforms or games they operate, common ones such as QQ Coins issued by Tencent in the Chinese client(Zhang-Zhang et al., 2020), B Coins, the Chinese video site named Bilibili(Fu & Fan, 2021), Platinum in Warframe which is the famous online game developed by Digital Extremes(Nejaim & Novikov, 2022), and et al. This type of virtual currency is different from the game currency that can be obtained through game activities in the game, and can generally only be obtained by purchasing real currency from the network operator, with a certain exchange ratio with real currency.

Game props, or game items, are a collective term for various virtual items in games. Game props are generally of different types, such as equipment-type, consumable-type, quest-type, material-type, and so on. There are various ways to obtain them, such as dropping them by killing monsters, completing game quests, purchasing or exchanging them through NPC merchants in the game, using virtual tokens to buy them directly in the game mall, trading them with other players inside the game, or auctioning them off, and so on(Moran-Ledesma et al., 2021).

Market value of online game virtual property.

Most of the virtual properties of online games can be traded flexibly offline and online among the player groups of a specific game, with the ability to be exchanged with real money, high economic value and huge market potential. Players in online games can trade virtual properties, including game props, accounts, etc., through various channels such as offline, social platforms and game intermediary platforms(Chen & Xu, 2022). These virtual properties may have been acquired through real money purchases and therefore have some market economic value in their own right and can be traded. At the same time, these virtual properties may also exist in online games, such as virtual tokens and characters, which can also be traded. Virtual property, such as digital currency, has economic value, and that in crimes involving virtual property, the amount of the crime needs to be determined by analysing the commodity value and financial value of the virtual property(Dolgieva, 2022).

Currently, the theoretical community has reached agreement on the basic principle of determining the value of virtual property in online games, that is, a new model of determining value should be explored on the basis of the determination of the amount of entity property offences. Li Peiyao suggested that the rule of "multiple thefts", which is stipulated in the Interpretation of the Supreme People's Court and the Supreme People's Procuratorate on Several Issues Concerning the Application of Law in Handling Criminal Cases of Theft, can be used to determine whether the perpetrator constitutes the crime of theft. The rule of "multiple theft" means that although the amount of property violated by each cybercrime committed by the perpetrator is relatively small and does not meet the conviction standard of the crime of theft, if the perpetrator commits theft more than 3 times within 2 years, it can be determined that it constitutes the crime of theft, thus avoiding the difficulty of determining the value of virtual property. Secondly, the value of virtual property is determined in accordance with the amount of stolen goods sold by the suspect and the actual loss suffered by the victim(P. Y. Li, 2020). This view did not directly face the difficulty of determining the value of network virtual property, but rather attempted to take a roundabout way of indirectly determining the amount of the offence, which, although practicable within a short period of time, would ultimately have to directly face the difficulty of determining the value of network virtual property as the virtual world of the network became integrated into the process of daily life. The value of different virtual property should be determined according to its legal interests, and that the principle of the "fill-in-the-blank" rule should be used to explore ways of determining the value of such property. The market prices should be given priority in determining the value of stolen virtual property(Ren, 2021).

As can be seen from the above research, there are many limitations in the current way of determining the value of virtual property in online games. The reason is that there are various types of online games, and the types of virtual property in online games are even more so, and different types of virtual property have different ways of obtaining and functioning, as well as different tradability. Targeted ways of determining the value should be proposed for different types of virtual property in online games.

METHODOLOGY

This paper adopts a qualitative research methodology, focusing on the literature relating to the identification of market value of virtual property in online games. Qualitative research methods refer to research that produces descriptive data - people's own written or spoken words and observable behaviour. Qualitative research methodology is a data collection technique that approximates the empirical world(Morgan & Smircich, 1980). Data sources for the qualitative research methodology include primary and secondary sources. The collection of data is significant for the research and this review process(Rahman et al., 2023). The data emphasised the application of the law, and addressing legal concerns(Nurhayati et al., 2022) which will deliver a certain reference for the research(Azmi et al., 2023). Primary sources include legislation and cases and secondary sources include relevant literature. This paper reads and analyses the existing materials. It discovers the sufferings faced by China in the process of determining the market value of virtual property in online games, and proposes appropriate ways of determining the market value according to the different types of virtual property in online games.

DISCUSSION AND FINDINGS

Difficulties in determining the market value of virtual property in various types of online games

1. Game Accounts

The difficulty in determining the value of game accounts lies in the composite nature of their value. The real value of a game account is the storage space of the network server it owns, as well as the network products attached to or stored in the storage space of the network server. That is, its value includes all the characters, props and virtual tokens in the game account. The game player's behaviour when logging into the game account, such as acquiring equipment, levelling up, consuming props, and recharging tokens, all change the value of the game account(Z. Y. Wang & Chen, 2023).

As a collection of a gamer's personal playing experience, each gamer invests different amounts of time, energy and money in the game account, and acquires different characters and props, and each account is a unique individual. This determines that even if there exists a market for trading game accounts, the trading prices of other game accounts in that market cannot be used as a direct reference for determining value. The price of a game account in a transaction is highly influenced by the subjective factors of the seller and the buyer. Theft personnel in the fraudulent acquisition of the victim's game account, if you want to sell in order to sell the stolen goods, then the amount of the stolen goods is likely to be very different from the true value of the game account, and it is not convenient to determine the amount of the crime as a standard.

All of the above factors determine that the calculation of the value of the game account is the most cumbersome, and needs to take into account a variety of factors combined with the specific circumstances of each case to carry out the calculation.

2. Virtual Tokens

The difficulty in determining the value of virtual tokens lies in the fact that they are not uniformly issued by the state, and their value in relation to legal tender is unilaterally controlled by the network service operator. The reason for this is that virtual tokens are essentially electromagnetic records, which are used to record the number of exchange tools purchased by gamers from online game operators(da Silva & Omar, 2021). For the online game operator, the act of illegally invading the computer system to modify the data to increase the virtual tokens in the account will not directly cause the reduction of its property, but will lead to the indirect loss of part of its profits, i.e., the perpetrator will not buy the virtual tokens from the victim unit through the proper channels after increasing the number of virtual tokens in the account, which indirectly leads to the loss of its property, which is difficult to quantify(Z. Y. Wang & Chen, 2023). In addition, the game player to the network game operators to buy virtual tokens, can only be used for the exchange of other game props,

services, and cannot be directly circulated in the real world, so there is no market price, the appraisal organisation cannot be appraised through the market price of its value.

3. Game props

The value of game props is greatly affected by various factors. For example, the adjustment and update of the game content by network operators, the adjustment of the value of specific props or the change of the probability of props falling will affect the value of the props in the player market. Game props are only valuable to players who play the same online game, and among such players, a stable trading price system is often formed, and players trade game props with each other through official or third-party intermediary platforms, similar to the purchase of real items(Y. X. Yang, 2021). In addition, the diversity of game props and the multiple ways of obtaining them make it extremely difficult to recognise their value. Game props include equipment-type props, consumable props, material-type props, mission-type props and other types of props, which can be obtained by killing monsters, mission rewards, NPC purchases or exchanges, player manufacturing, clearance rewards, shopping mall purchases, sweepstakes and so on. In order to encourage players to top up, game operators will restrict the circulation and trade of some high-value props among players. Taking Valve's Dota 2 game as an example, there is only one kind of "dress-up" props used to change the appearance of characters in the game, and most of the "dress-up" props can be purchased on Valve's SQL Server, which can be used to change the appearance of characters. Most of the "dress-up" items in the game can be traded normally on Valve's Steam platform marketplace. In addition, the game also sells "Warrior Warrants" 1-2 times per year, and after purchasing a "Warrior Warrant", players can obtain a dress that is a limited reward for the current Warrant, which cannot be traded and is permanently unavailable after the duration of the current Warrant has expired(Y. Zhang et al., 2018). The high value of this type of game item makes it impossible to be ignored when calculating value, but its non-tradable attribute results in no market price for reference.

Value Determination of Online Game Virtual Property with Different Sources of Value

To solve the dilemma faced by the value determination of virtual property in online games, the underlying logic of the acquisition of property attributes by virtual property in online games should be analysed from the value generation theory. The key to determining whether virtual property in online games has property attributes lies in whether it is involved in the exchange and transaction of real money. Only if the virtual property enters the real-world transaction mechanism, and the victim pays time, energy or money for obtaining the virtual property and loses the control and domination over the virtual items of the same value due to its loss, can it be said that such loss possesses the property nature. Therefore, the property nature of virtual property does not derive from the data code itself that generates the virtual item, but from the exchange and transaction of real money.

Therefore, on the basis of traditional classification, online game virtual property can be divided into three categories from the way of acquisition. The first category is the virtual items generated by the game software programme itself, i.e. virtual tokens, game props, etc., which are generated by online game operators through computer codes and have not entered into the field of trading. The second category is virtual property directly purchased by game users with money, such as various virtual tokens and game dress-ups purchased through real money. The third category is the tradable virtual property obtained by game users through online play, such as game props obtained by game users in the process of levelling up the game or collecting materials for making game props. By analysing the correspondence between these three types of online game virtual property and real money, analysing the source of their value and exploring ways to quantify them in real money, a framework for determining the value of online game virtual property can be initially established.

1. Virtual items generated by the game software programme itself

As the game software programme itself is controlled by the online game operators, the game operators can produce unlimited virtual property, while the ordinary users can only obtain it by purchasing it from them or through online upgrading, killing monsters and completing tasks, which means that the online game virtual property can be copied unlimitedly by the online game operators, but there is scarcity of it for the game users. Therefore, online game virtual property has no value for online game operators, but has value for ordinary users.

According to the above theory, in the case of virtual property theft to determine the value of the virtual property generated by the game software programme itself, should distinguish between the

victim is the network game operator or ordinary game users. If the victim is an online game operator, as the owner of the online game data code, after a one-time construction of the game system, only need to modify a small amount of code within the system, can be nearly unlimited output of game props and game currency, so the online game operators for the game players to set the price of the value of the value of there is no strong corresponding relationship between the price does not directly reflect the value of the price. The relationship between the output and input of virtual property is not only non-linear, or even not very relevant, the relationship between its income and cost input is very weak(M. K. Zhang, 2015). If the victim is an ordinary gamer, regardless of the way he or she acquires the virtual property, the virtual property has a different value significance to the ordinary gamer. For ordinary gamers, regardless of the way to obtain virtual property, they have at least invested money, energy, time, emotions, etc., and the investment will be lost with the violation of the virtual property.

Therefore, the value of the virtual property generated by the game software programme itself should be determined according to the amount of stolen goods sold by the suspects. On the one hand, the determination of the value of the virtual property is meaningless to the network game operator, because even if the virtual property is stolen, the network game operator can generate the virtual property by itself, and the network game operator will not suffer any actual loss. On the other hand, for ordinary gamers, since the virtual property cannot be traded among gamers, it has no market value. In order to make up for the loss of the ordinary players, the court may order the online game operator to help the ordinary players to recover their virtual property in the game through technical means such as "back file", and it will not cause any loss to the online game operator. Therefore, the amount of stolen goods to determine the value of the virtual property can be in line with the law of value production, but also can be convicted and sentenced to criminal suspects.

2. Virtual Property Purchased by Game Users in Real Money

Virtual items purchased by game users refer to virtual property (such as virtual tokens such as Q Coins or other paid props) purchased by users from online game operators whose prices are relatively stable and whose value does not change as a result of the users' behaviour. This type of virtual property has two characteristics: first, the service provider sells this type of virtual property with a clear price, and its price is relatively stable and will not change easily. Secondly, this kind of virtual currency does not belong to the service provider, but is acquired by users, i.e. ordinary consumers, through purchase, not through their own labour or game activities, i.e. its value comes from the users' capital investment, which is more likely to correspond to the value of real money. For this kind of virtual property, its value comes from the correspondence of the real monetary value invested by the game users, not from the game programme itself. In other words, the money invested by the user of the game adds a property value to the virtual items purchased by the user, and the infringement of this type of virtual items is essentially an infringement of the real currency that it represents in a real transaction. Calculating the value of this type of virtual property on the basis of the amount of money invested is conducive to the acquisition of electronic evidence by investigators. This is because the purchase of virtual items by game users occurs on the network and is traceable. The essence of virtual property is stored in the network game service provider computer server data, and game users to buy virtual property behaviour will be on the server as well as their own account data modification, and the means of payment are online payment, payment records can be queried for a long time to effectively avoid the risk of effective payment credentials destroyed and lost. Virtual property offences often involve electronic documents or other electronic record information, once the suspect deletes and hides this information, it can be recovered and collected with the help of electronic data forensics(Liu & Zhang, 2017). Therefore, the market value of such virtual property should be determined by the amount of money invested by the game user.

3. Tradable Virtual items Acquired by Game Users in the Course of Online Playing

Virtual items acquired by game users in the course of online play refer to virtual property (such as equipment and weapons in the game) obtained by game users from online game operators or other players and upgraded after processing. This kind of virtual property is characterised by the fact that although game users can obtain them for free or at a low price from game NPCs or game officials, they are generally of a lower level or have poorer attributes. And because they are obtained for free, they do not have much market value when traded with other players. The value of this kind of virtual property mainly comes from the time and energy spent by game users to build and upgrade the virtual property after acquiring it.

In online games, if gamers want to get a better gaming experience, in addition to purchasing paid props through real money, they can only spend a lot of time and energy to kill monsters, complete tasks and other repetitive operations, the process is often very boring. The users have the right to voice their rights(Mohd Zahir et al., 2019; Mohd Zahir et al., 2019). Thus, many game users do not want to spend time and energy to do these things, they want to use the right price of real money to other players to buy virtual items or "booster" services, so the formation of a prosperous virtual property market. This is also the underlying logic of the formation of the virtual property market in online games. For this kind of virtual property that can be traded among game players, many online game virtual property trading platforms have been spawned due to the demand for trading among the player groups, so the trading of this kind of virtual property has formed a stable market and its market value is relatively stable. The market price should be used as the basis for price determination of virtual items acquired by game users during online play.

CONCLUSION

Online game virtual property is a new form of property derived from the information network era, its dependence on the computer information network and the virtual nature of the property with the traditional property both in common and there are some differences. At present, in the face of more and more kinds of online game virtual property, the lack of legislation makes the value of online game virtual property in China is still facing many problems. Therefore, the source of value of online game virtual property must be based on the complexity of the virtual property types to distinguish, respectively, the value of the determination of the mechanism set. According to the different sources of value of online game virtual property, online game virtual property is divided into virtual property generated directly by the game software programme itself, virtual property purchased by game users with real money, and virtual property that can be used for inter-player transactions after processing and upgrading by game users in the process of playing the game through the game's internal mechanism. For the different value sources of online game virtual property, the proposed targeted different value determination is conducive to achieving fairness and justice in the current judicial practice in China.

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