

# Comparative Research of Chinese and American Game Mechanism Design

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**Abstract.** The video game industry is one of the most influential entertainment industries, which has been generating high revenue and developing rapidly in recent years. However, in recent years, social problems caused by video games have emerged in China. This article proposes that game mechanism is an important kernel of game design and has a crucial influence on the social significance of games. By comparing China and the United States, the article analyzes the history of game mechanism design in both sides, draws the reasons for the healthy development of the game industry in America and uncovers the problems of the game industry in China, and proposes optimization strategies for game mechanism design in China in combination with the current situation.

## 1. INTRODUCTION

In recent years, China's game industry has grown rapidly with increasing revenue. The "2021 China Game Industry Report" shows that China's game market sales revenue in 2021 will reach 296.513 billion yuan, with mobile games accounting for 76%. Domestic game users have reached 666 million [1]. Tencent, along with Microsoft and Sony, became one of the world's three largest game companies.

However, accusations and restrictions on video games continue. In 2021, several events proposed a "slowdown" in the gaming industry. The approval department froze the version number in July [2], and in August an article caused mainstream game company stock prices to plummet. The State Press and Publication Administration limited game time and expenditure for minors [3]. These measures reflect a negative image of video games.

Negative effects of video games often refer to addiction. Players are attracted by game content and become addicted, causing damage to health, personal quality, and relationships. Game addiction affects individuals and hinders social development. China is known as "the country that hates video games the most" but has one of the highest addiction rates at 27.5% [4,5]. The US has an acceptable addiction rate despite having a developed game industry. Game addiction is not related to industry development but to game mechanisms.

Game mechanisms define how the game is played and how much fun players have [6]. The US uses quality game mechanisms to attract users and improve word of mouth, while China focuses on commercial value. The US model entertains the public without hindering normal life, while the Chinese model ignores the positive effect

of high-quality game mechanisms, resulting in social problems. This leads to strict control and restriction of the game industry.

Examining the history of game mechanism design in China and the US can help understand how the US formed a good cycle and how China can learn from it. This can help Chinese games return to the right track and make games conform to human nature without hindering social development. It also allows for introspection on the "short, flat, and fast" mode of Chinese games.

## 2. THE HISTORY OF AMERICAN GAME MECHANISM

According to game design guru Adams Ernest, video game mechanisms can be classified into five categories: physical simulation, internal economy, progressive mechanism, tactical maneuvering, and social interaction. The internal economic mechanism is considered the main cause of addiction [7]. The development history of game mechanisms in the US can be divided into three periods: pioneering exploration on simple devices, hardware technology feedback on mechanism design and formation of templates, and software technology feedback on mechanism design and prosperity of new mechanisms.

### 2.1 The early stage of exploration of the mechanism - the era of simple game equipment

Video games originated in the US in the 1950s and became commercial in the 1970s. The video game industry quickly attracted capital and developed rapidly. From the 1970s to the 1990s, it was the "prehistoric era" of video game mechanism research. The initial design of

game mechanisms was limited by hardware devices. Video games were mounted on fixed electronic devices with rough pictures. Cassettes solved the problem of “one game for one device”. The screen was simple and black and white pixel screens were mainstream. Game mechanism design was relied on to attract players. Compared to traditional game mechanism design, video game mechanism design was a new and unknown research direction.

In just a few years, designers developed various imaginative games despite hardware limitations. The game works of this period were varied and brilliant. Designers filled games with elements of playability. An abstract internal economic mechanism was constructed with integer numbers. A simple computer branch statement was used to build a progressive mechanism with branch levels. A physical simulation mechanism was constructed with unscientific and simple mathematical formulas. The “Mario” series is the culmination of these three types of mechanisms. The mechanism design of this era was limited by hardware but free in content design. These mechanisms brought short-lived fun but lacked the shaping effect of spiritual culture.

## **2.2 The template-forming period of the mechanism - the era of complex game equipment**

The 1970s to 1990s were the second development period of game mechanism design. The US economy recovered and game companies became a popular option for investors. Various framework regulations began to take shape. Thanks to hardware development, the five game mechanisms were well known to players and game mechanism design began to “industrialize”. Many templates for later generations were initially established.

Games in the “prehistoric” period were dominated by single-player games. The second stage included the “online game” branch due to internet technology development. Stand-alone games developed rapidly and hardware improvement allowed players to face more game units. In the 1990s, *Dune II: Battle for Arrakis* introduced complex tactical maneuvers. Online games also emerged in the 1990s and the social interaction mechanism entered history. Online game players in the US make up a “diverse gaming community” [8]. *Quake* was the precursor to internet “first-person shooter” and established a gunfighting game template [9]. Hardware development enriched the effect of the progressive mechanism and began to make the game derive a culture of thought that affects the spirit. Various game stories, world views, and characters are still talked about by players ten years later.

Mechanism design has become systematic and standardized. With complete major mechanisms, templates have formed. Few new types are produced and game design has plateaued.

## **2.3 A New Era of Exploration of Mechanisms—The Age of Graphics**

Online and stand-alone games are popular in the 21st century. In the 1990s, games transitioned from 2D to 3D but lacked realism due to insufficient rendering technology [10]. After the millennium, graphics development improved rendering, geometry, and physical simulation. This enabled film-level 3D game screens and complex animations. Mechanisms and physical simulations improved greatly. Game stories are more realistic and emotionally resonant.

Software advancements improved mechanism design in online and commercial games. Online games use economic and social mechanisms to increase immersion while single-player games use progressive mechanisms for visual impact. MMORPGs like *World of Warcraft* pushed social interaction to its peak. Single-player 3A games like *Resident Evil* and *Call of Duty* increased player satisfaction [11]. Independent game teams broke traditional templates using graphics technology. Computer technology is no longer a barrier to mechanism design. This allowed game mechanism design to flourish and game culture in the US to prosper.

In the US, big games are the main focus, followed by online games and independent games. TGA Awards nominations show that the highest quality games have a progressive mechanism. This mechanism is most recognized by players and is least likely to cause addiction. The wonderful world view and plot can greatly impact players' spiritual literacy.

In the era of graphics, online and stand-alone games inherited old templates while independent games blossomed. A set of criteria for “good games” has formed, allowing games to conform to human nature without hindering social development.

## **3. DEVELOPMENT AND PROBLEMS OF GAME MECHANISM IN CHINA**

### **3.1 The emergence of Chinese game mechanism**

The history of Chinese games can be divided into three periods: the re-engraving period, the imported period, and the self-research period.

China's game market was initially chaotic with no electronic publication law. Pirated game consoles flooded the market, including the Xiaobawang console which copied Nintendo FC. Without technical accumulation, it couldn't compete long-term and became a memory for post-70s and 80s generations [12].

With electronic publication laws and commercial interests, businesses became game agents for foreign manufacturers. They produced Chinese manuals and repackaged games for distribution in mainland China. Most games were imported, with *World of Warcraft* by Ninetowns Games and *Legend of Blood* by Shanda Games being the best during this period.

Becoming a foreign company “distributor” doesn't allow local companies to obtain enough profits. Maximizing commercial interests requires mastering the entire “R&D-distribution-operation” process. Thus, self-developed games started in China. Tencent, with a large QQ customer base but lacking monetization means, decided to turn customer traffic into commercial profits through video games. In the early days, Chinese companies had little technology accumulation but were eager for profits. They tried to eliminate uncertainty caused by originality by imitating games with simple project selection mechanisms but high commercial added value. In short, technical achievability and commercial value were the top two criteria for game project establishment. The former was superior to the latter, and a “profitable skin-changing game” was born. The “skin-changing game” achieved great commercial success but plagiarized rules and gameplay, damaging market order and original creators' interests [13]. It not only ignored the social role of game mechanism but also deliberately used internal economic mechanisms causing replay and addiction, giving video games infamy such as “Electronic heroin” and “spiritual opium”.

In short, local game manufacturers aim to maximize commercial benefits by reproducing profitable game mechanisms. Mechanism design is neglected and used for commercial gain rather than player entertainment. This “short-term and fast” model creates a negative cycle of low-quality games and exacerbates conflicts between rational people and game companies.

### **3.2 Internal economic mechanisms confuse reality and virtuality**

An addictive and valuable game mechanism is the unreasonable use of the internal economy. This virtual economic system produces and consumes resources [14]. Players are stimulated by feedback loops and a sense of gain to indulge in simple values, such as leveling and wealth for their characters.

Capital uses players' value recognition to magnify virtual prop values. The internal and external economies are linked, allowing players to convert in-game and real-world wealth. Merchants can “control” users by modifying values. Some players become “game addicts” and use real wealth to improve in-game wealth. Chinese players have low requirements for game aesthetics due to a lack of interesting mechanisms. for game aesthetics due to a lack of interesting mechanisms.

### **3.3 The social interaction mechanism replaces actual social interaction**

The social interaction mechanism is addictive and provides a virtual social venue. However, it can lead to physical and mental health problems [15]. Virtual social networking cannot replace real social networking and can cause uncivilized behaviors. The value of money

supremacy in games does not conform to core socialist values.

In summary, Chinese games began with commercial needs and have grown in a harsh environment. Their profitability is recognized worldwide. However, virtual mixed reality causes network problems and conflicts between the public and game companies.

## **4 OPTIMIZATION STRATEGIES FOR GAME DEVELOPMENT IN CHINA**

From the comparison between China and the United States, we can see that to effectively reduce the addiction rate and reduce the negative social impact of video games, the most fundamental and urgent thing is to start from the design of game mechanism. The game's mechanism design ultimately determines its entertainment and its effect on players. It is the “internal gene” before the game takes shape, and like DNA, it determines what an individual will eventually grow into. The “gene editing” of Chinese games mainly relies on the joint action of developers and the government.

### **4.1 The R&D party pays attention to the social role of the game mechanism when setting up the project**

The social role of the game mechanism refers to the value of the game mechanism in maintaining social balance. Games with a high social role can relieve people's fatigue after work, thereby promoting the healthy development of individuals; games with a low social role make people trapped in it and delay life. and work, resulting in many adverse effects at the social level. A developer refers to a business group that conducts game development activities. At present, domestic mainstream game manufacturers uphold the perspective of market theory and conduct game project establishment with commercial interests as the leading factor. A “short-lived and fast” commercial plundering cycle is constantly being staged. Various low-quality games have turned into “short-lived predators” and run rampant in the game market. Large factories have become a breeding ground for “short-lived predators”. To break this unhealthy cycle, one is to formulate constraints on game planning, and the other is to establish an internal team to evaluate the social role of game mechanism.

Setting constraints on the mechanism of game planning can help correct the current bad cycle at its source. Game planning requires corresponding industry norms or evaluation systems to measure the value of work output. When designing game mechanism, planning needs to consider the gains and losses of players from the perspective of social significance. In the classic game mechanism design framework, the most important thing for planning is the challenge and reward. From the perspective of social role, it is the actual payment and virtual gain for the player. In terms of effort, the game mechanism test players' various abilities, and at the same time, players will also dedicate their

time and energy to the game. Therefore, useless time consumption purely serving commercial interests needs to be reduced. For example, the current complex task system is dominated by internal economic mechanisms. Players spend several hours in the game every day, and long-term virtual immersion will inevitably bring about the incompleteness of real life. Planning needs to make players spend as little time as possible in the real world, avoid using the internal economic system to force players to stay, and constantly repeat low-added behaviors, thus confusing real and virtual internal economic mechanisms and causing long-term consumption. The application of social interaction mechanisms needs to be limited. In terms of harvest, players need to obtain more content with practical application value. At present, most games endow players with virtual prop values and online rankings that inspire vanity, but these do not allow players to improve their mental ability in reality. Therefore, the proportion of progressive mechanisms should be increased, and specific stories should be used to improve cultural output; the proportion of tactical maneuvers and physical simulation mechanisms should be increased to strengthen the puzzle performance of the game, exercise global control, hand-eye coordination, pattern recognition, etc. The ability also has important value in the world, providing assistance for the player's self-realization in the real world, and the player's gratitude for the additional effects of the game will promote the virtuous business cycle and let the whole society improve due to the high added value of the game. Inclusiveness of the game.

After game planning has carried out the mechanism design, the corresponding internal team is also required to evaluate the final design plan. At present, game companies have not yet established such teams. However, such evaluation teams are the link that truly combines the commercialization of games with the social responsibility of game design. They need to formulate an evaluation system about the social role of game mechanism and develop an evaluation system in the project development process. In the process, this system is constantly updated and iterated, and finally, the game mechanism with the most social value and the game mechanism with extremely high social value and commercial value are recorded. According to the evaluation system, certain constraints are given to the planned work content so that a virtuous cycle first emerges within the company. A good evaluation system is likely to exist as a general standard in the industry for a long time, thus affecting the entire game ecosystem and finally rectifying the name of domestic games. Therefore, the success of the company's internal evaluation team for the social role of game mechanism cannot be delayed.

In summary, starting from the game mechanism, checking the mechanism design link of planning and setting up an evaluation team to control the social role of the game mechanism are what game developers need to implement and can form a good business cycle and enhance the social significance of the game. important means.

## 4.2 Policies support and guide independent game studios

Clear policy support will guide the game industry. Without "planning", a market economy will grow unchecked and prioritize profit. Policy guidance is often more efficient than developer implementation. This includes positive regulatory guidance during approval and supporting rule-abiding game development groups.

Clear rules and regulations are needed when approving version numbers. China has approved game version numbers since 1996 [16], but game content gatekeeping is lacking and review requirements are vague. This results in some games with positive social value being sold overseas instead of in China. Social value and negative addictive drawbacks should be considered during review. Regulations should be clear and actively guide the industry towards a virtuous cycle.

After creating regulations and guidance, policy support should be given to cooperative teams. Teams willing to cooperate and with strong executive ability should be selected. Mainstream companies like Tencent and NetEase prioritize commercial interests over social value. Independent game groups focus on game mechanisms and are highly malleable. They can be the main support target to improve the industry ecosystem from bottom to top. The mechanisms and social significance of independent game companies should be evaluated and policy support should be given to high-rated products.

In summary, With the rapid development of China's game industry, there is a need to solve problems at the root. Control and specification of game mechanism design needs attention from developers and the government. A positive feedback loop where social value feeds back to business development should replace the current profit supremacy loop. This will alleviate social problems and make video games a positive force for society.

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