

## 12. FUTURE OF BLOCKCHAIN GAMING

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The future of blockchain gaming, including its potential impact and the challenges it encounters, is explored in this paper. Some scientific principles underlying blockchain gaming and potential development of the industry are described.

Blockchain technology has existed for over a decade, and it has influenced various industries, such as finance, supply chain management, and healthcare [1]. Recently, the gaming industry has also integrated this technology, resulting in the emergence of a new category known as blockchain gaming. This term refers to video games that utilise blockchain technology to produce a gaming experience that is decentralised, transparent, and secure. The field of blockchain gaming is rapidly growing and holds considerable potential for innovation and development. With the continued advancement of blockchain technology, it is anticipated that gaming will have new applications that surpass the mere possession of in-game assets.

Recent trends indicate that blockchain gaming is gaining a lot of popularity, as more people recognise its potential to revolutionise the gaming industry. According to a recent report by Polaris Market Research, blockchain gaming is expected to grow to a \$1.02 trillion industry by 2032 [2]. The report also suggests that blockchain gaming will become widespread, as gamers seek captivating, interactive, and decentralised experiences.

There is an increasing interest in exploring the potential of combining blockchain gaming with other emerging technologies, such as virtual reality (VR), augmented reality (AR), the Internet of Things (IoT) or Machine Learning.

The integration of virtual reality and augmented reality technologies into blockchain games has the potential to revolutionise gaming experience by immersing players in a realistic virtual world where they can interact with other players and objects in real-time. The technology enables gamers to experience games in a more engrossing manner than ever before, providing them with a level of interactivity and realism that has never been possible.

The adoption of VR and AR technology in blockchain games could lead to a shift in the gaming industry. With this technology, gamers will have the opportunity to be transported into virtual worlds and become fully immersed in the game environment. Moreover, it could foster a new level of social interaction within the gaming community by bringing players together in a virtual space. So blockchain gaming could potentially change the way people experience and interact with games, creating a new era of gaming that is more engaging, enthralling, and socially connected.

The Internet of Things (IoT) is a network of interconnected devices, vehicles, and appliances that are embedded with sensors, software, and other technologies to enable them to exchange data and interact with each other. They are becoming increasingly popular and ubiquitous in our daily lives. By integrating blockchain technology with the IoT, it is possible to create a decentralised network that can securely and transparently exchange data and value among devices.

In the context of gaming, the integration of blockchain and IoT can open up new possibilities to create captivating gaming experience. For example, in a smart home environment, IoT devices could be used to trigger in-game events or unlock new content based on real-world actions or events. This could include actions such as turning off the lights or opening the refrigerator.

Another potential application of blockchain and IoT in gaming is the creation of new forms of in-game assets. For example, IoT devices could be used to generate unique digital assets that are connected to real-world objects or locations. These assets could then be traded and used in blockchain games, creating a new level of scarcity and value for in-game assets.

Machine learning is a subset of artificial intelligence that involves building algorithms and models that enable machines to learn and make decisions based on data. As machine learning algorithms become advanced and blockchain technology continues to evolve, the possibilities for combining these two fields are getting increasingly intriguing.

One potential application for machine learning in the world of blockchain gaming is in the development of more intelligent game characters. By using machine learning algorithms, game developers can create characters that are capable of learning and adapting to their environment. Also machine learning algorithms can be used to develop realistic behaviors for these characters, making them more human-like in their interactions with players.

Another area where machine learning can be applied to blockchain gaming is in the analysis of player behavior. By analysing large amounts of data regarding player behavior, machine learning algorithms can identify patterns and trends that can be used to improve game design and enhance the overall gaming experience.

The principle of decentralised systems is crucial for blockchain gaming. Blockchain technology makes it possible to create decentralised networks that can operate independently of central authorities [3]. In blockchain games, players can interact with each other and the game without intermediaries. This can lead to more secure, transparent, and fair gameplay as players can be sure that the game rules are being followed, and their transactions are secure.

Smart contracts are another scientific principle that is important for blockchain gaming. They are self-executing agreements that are stored on the blockchain. In blockchain gaming, smart contracts can automate various aspects of the game, such as reward distribution or management of in-game economies. This makes the game more efficient and reduces the risk of human error or fraud.

By providing more transparent and secure gaming experience, blockchain technology can address some of the industry's long-standing issues, such as cheating and fraud. Additionally, blockchain gaming can offer new revenue streams for developers and publishers through selling in-game assets and using non-fungible tokens (NFTs). NFTs make it possible to create unique, verifiable digital assets that can be bought, sold, and traded by players. This opens up new possibilities for ownership and monetisation in gaming industry.

Another area where cross-game economies can have a significant impact is in the realm of e-sports. By enabling cross-game trading, players can create their unique in-game asset portfolios that they can use to compete in various games and tournaments. This can create a new level of competitiveness and diversity in e-sports and attract more players to the gaming industry.

One of the most exciting aspects of blockchain gaming is the potential for players to earn real-world rewards for their in-game achievements. Some blockchain games have already started implementing this feature, granting players an ability to sell or trade items (Figure 1) to earn cryptocurrencies that can be exchanged for real-world goods and services [4]. This feature has the potential to change the way people think about gaming, as players not only play for entertainment but also for financial gain.

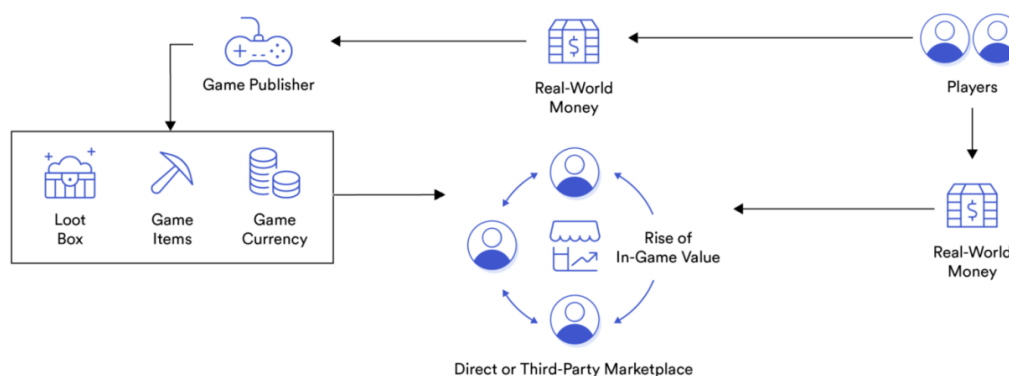


Figure 1 – Scheme of blockchain games economies.

The advancement of blockchain technology is rapidly transforming the way players interact with games. As the technology continues to evolve, it is expected that the developments in the world of blockchain gaming will become even more exciting. This trend opens up new possibilities for game developers to create sophisticated and compelling games. With the introduction of blockchain technology, gaming experience has reached new heights, providing players with new ways of engaging with their favorite games.

Blockchain gaming represents a significant opportunity for both players and developers to engage with new technologies and create innovative gaming experience. As the field continues to evolve, it is expected to see more sophisticated and immersive games that push the boundaries of what is possible with blockchain technology.

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