The Application of Cryptocurrencies in the Metaverse

A case study based on the application of cryptocurrencies in Gamfi

Zheming Lou[1,a,*]

[1]School of Humanity and Law, University of Science and Technology Beijing, Beijing, China, 100083
a. 1760532517@qq.com
*corresponding author

Abstract: In recent times, the utilization of cryptocurrencies in the Metaverse has garnered increasing attention, with the advent of blockchain technology and the surge in popularity of the Metaverse. This investigation endeavors to ex-amine the implementation of cryptocurrencies in the Metaverse, as well as its influence on the cryptocurrency market and the progression of the Metaverse. This study adopts the method of combining literature review and case analysis, first sorts out the application scenarios of cryptocurrencies in the Metaverse, including transactions, games, virtual assets, etc.; then sum-marizes the application scenarios of cryptocurrencies in the Metaverse through case analysis Advantages and challenges, including decentralization, security, traceability, etc.; Finally, the development trend and prospect of cryptocurrency in the metaverse are discussed, and the impact of this appli-cation on the cryptocurrency market and the development of the metaverse is analyzed. The results of the study show that cryptocurrencies have great application potential in the Metaverse. First of all, the decentralized nature of cryptocurrencies can guarantee the security and traceability of transac-tions and assets in the Metaverse. Secondly, the circulation and use of cryp-tocurrencies can also promote economic development and prosperity in the Metaverse. However, the application of cryptocurrencies in the Metaverse al-so faces many challenges, including transaction speed, user experience, and compliance.

Keywords: cryptocurrency, metaverse, application

1.   Introduction

In recent years, the extensive utilization of cryptocurrencies has been fostered by the emergence and development of blockchain technology. Cryptocurrencies are per-ceived as digital assets capable of substituting traditional currencies and are exten-sively employed in transactions and investments. Moreover, the decentralized nature of cryptocurrencies enables their utilization in transactions and contracts without intermediaries, thereby enhancing transaction efficiency and transparency. Simulta-neously, the Metaverse, a virtual digital world, is increasingly viewed as the primary arena for forthcoming digital social, entertainment, and commercial activities. Con-sequently, exploring the application of cryptocurrencies in the Metaverse holds vital theoretical and practical significance for the future evolution of cryptocurrencies and the Metaverse.Theories on social and emotional learning

have been proposed and developed by Western scholars, present academic research on proper approaches and the positive effects on implementing SEL are mainly done outside China, where educational and psychological experts found that receiving SEL can promote health physically and mentally, improving academic performance, upgrading socialization degree and obtaining sense of achievement. What's more, mainly three categories concerning methods of executing SEL project are concluded by scholars, to set up an independent curriculum, to integrate SEE into the current curriculum, as well as to create a safe, well-managed and supportive learning environment [2].

The Metaverse is a virtual world and living vision that starts from the game platform, is based on digital currency, and is supported by a series of integrated digital technologies and hardware technologies, in which human life is deeply in-volved. The development of a new type of digital economy based on blockchain technology [1].

Since the birth of the Internet, it has promoted tremendous development of productivity in a short period and profoundly changed people's production and life-style. Among them, Internet finance is on the ascendant. The rapid development of P2P network credit, crowdfunding, etc., and the mutual promotion of traditional finance have shown strong vitality. Internet currency is also emerging, which in-cludes online community virtual currencies represented by AmazonCoin, and Face-bookCredits, as well as new digital encrypted currencies [2].

This article aims to discuss the application of cryptocurrency in the metaverse, analyze its current landscape、challenges and prospects for the future, and adopt the method of literature review and case analysis. First, it sorts out the relevant concepts of the application of cryptocurrency in the metaverse, Application scenarios, includ-ing transactions, games, virtual assets, etc.;Secondly, this paper discusses the fol-lowing research questions through the specific case analysis of the application of cryptocurrencies in Gamfi field: 1. The transaction and payment functions of crypto-currencies in the Metaverse; 2. The advantages and disadvantages of the interaction and integration between cryptocurrency and metaverse; 3. The future application direction of cryptocurrencies in the metaverse and specific suggestions. Summarizes the advantages and challenges of cryptocurrencies in the metaverse, including de-centralization, security, traceability, etc.; finally discusses the development trend and prospects of cryptocurrencies in the metaverse, and analyzes the impact of this application on encryption Implications for money markets and metaverse develop-ments.

The results of the study show that cryptocurrencies have great application po-tential in the Metaverse. First, the decentralized nature of cryptocurrencies can guar-antee the security and traceability of transactions and assets in the Metaverse. Sec-ondly, the circulation and use of cryptocurrencies can also promote economic devel-opment and prosperity in the Metaverse. However, the application of cryptocurren-cies in the Metaverse also faces many challenges, including transaction speed, user experience, and compliance.

2.   Theoretical background

As an important carrier and comprehensive scene for the future development of the digital economy, the meta-universe is a key force to promote the high-quality devel-opment of the digital economy. Blockchain is the supporting technology of the meta-universe economic system, and digital currency is the initial application tool of blockchain. First came the digital currency, then came the blockchain. As a classic type of digital currency, the study on the application of cryptocurrency in the meta-universe can promote the development of the future digital economy and meta-universe industry.

2.1.   The concept of the metaverse

From the perspective of social development, Metaverse is a new form of the human social system under the development of high digitization and intelligence. It closely integrates the economic system, social system, and identity system of the virtual world and the real world to realize the interconnection

of everyone and the intercon-nection of things. , character interconnection, relationship interconnection, value interconnection, virtual reality interconnection, and intelligent interconnection; from the perspective of economic development, Metaverse is an open, decentralized, and connected editable immersive digital economic system, in which digital assets are created by users, and asset ownership is completely owned by users; from the per-spective of technological development, Metaverse is a new form of parallel virtual reality that emerges after the development of technology to a certain extent and the integration of various new technologies, will open a new stage of informatization development; from the perspective of Internet development, Metaverse is considered to be a new generation of Internet development paradigm after the revolution of the Internet and mobile Internet. It integrates various virtual components, and its users can develop and Explore this digital virtual world parallel to the real world. In es-sence, the metaverse is an interface between the real world and the digital world. The abstract program interface will eventually be replaced by an immersive experi-ence, and the real world will be seamlessly connected with the digital world through the immersive experience [3].

For now, the metaverse is still a growing and evolving concept, with different play-ers adding meaning to it in their own way. Among them, the most representative definition of "meta-universe" is: "meta-universe" is a parallel to the real world, but independent of the real world virtual space, is a mapping of the real world online virtual world, is more and more real digital false world.

2.2. Cryptocurrency concepts and basic attributes

Cryptocurrencies rely on blockchain architecture design, based on a distributed payment system to achieve the decentralized background of peer-to-peer secure transactions. Cryptocurrency has the following characteristics: First, it is decentral-ized. There is no single group or institution controlling the cryptocurrency network, and its supply is constrained by algorithms. Second, flexibility, cryptocurrency wal-let or address without any fees or regulations, and cryptocurrency can easily achieve cross-border transactions. Third, transparency, every transaction will be disseminat-ed throughout the network, and records of all transactions are stored in the block-chain, which is open and distributed, so every miner can verify them. Fourth, irre-versibility, transaction records are irreversible, once the transaction is confirmed can only be repaired by new transactions account. Fifth, the transaction is fast, it takes about 10 minutes to verify the transaction, and the transaction is usually completed after a few minutes. Sixth, the transaction fee is low. There is no transaction fee for the transfer of the transaction currency. Even on the trading platform, the transaction fee is very low.

2.3. The concept of the Gamefi

GameFi is a portmanteau of "game" and "finance." The concept involves blockchain games that offer economic incentives to play, otherwise known as play-to-earn (P2E) games.The essence of GameFi is to transform the traditional game infrastruc-ture by combining blockchain technology and decentralized finance, enabling play-ers to extract their in-game gains from the game into their own real digital assets We explain in detail how GameFi and traditional games differ, and carve out the unique value proposition of GameFi [4].

In GameFi, there are a variety of reward mechanisms and forms of reward, including but not limited to cryptocurrencies. Players can get virtual land, avatars, weapons and even clothing items in GameFi, which seem to be the same as traditional in-game assets, but most of these rewards are in the form of NFT in every GameFi pro-ject. A small number of rewards are not NFT but can be converted into the corre-sponding NFT and traded on the NFT market. In other words, GameFi ensures that each player can convert their in-game assets into personal digital assets by handing out rewards in the form of cryptocurrency and NFT.

3. Case Analysis: Cryptocurrencies and Gamfi development model

3.1. The use of cryptocurrency on Gamefi

GameFi is an emerging field that combines games and DeFi (decentralized fi-nance). It combines encrypted games with blockchain and DeFi technology, allowing players to earn, buy, sell, and trade cryptocurrencies in the game. Applications of cryptocurrency on GameFi include:

Reward mechanism: GameFi projects usually use cryptocurrency as an in-game reward mechanism. Players can obtain tokens as in-game rewards. These tokens can be used for in-game purchases or traded on exchanges to obtain actual monetary benefits.

Currency Exchange: Cryptocurrency can be exchanged for in-game virtual cur-rency in GameFi. For example, players can use cryptocurrencies such as Bitcoin or Ethereum to purchase the in-game virtual currency that can be used in the game.

Lending and Trading: In GameFi, cryptocurrencies can also be used for lending and trading. Players can use cryptocurrencies as collateral, get loans, or participate in transactions to earn more tokens or virtual currency.

Marketplace Issuance: GameFi projects often issue tokens that can be traded on exchanges. Players can use cryptocurrencies to purchase these tokens to gain equity or access to GameFi projects.

In general, cryptocurrencies are widely used in the GameFi field, which can make it easier for players to earn and use cryptocurrencies, and also promote the populariza-tion of DeFi and blockchain technology in the game industry.

3.2. The future trend of cryptocurrencies in the field of Gamefi

Cryptocurrency is a digital asset based on blockchain technology, which has the characteristics of decentralization, security, transparency, and programmable. The application of cryptocurrency in the game field, also known as Gamefi, refers to the use of technologies such as cryptocurrency and smart contracts to provide more value creation and exchange mechanisms for games, such as tokenization, NFT, DAO, etc.

According to relevant research reports and industry observations, it can be analyzed from the following aspects:

- Innovation in-game content and gameplay. With the development of cryptocurren-cy and blockchain technology, game content and gameplay will become more abun-dant and diverse, such as Metaverse, cross-chain games, social games, sandbox games, etc. These games not only provide entertainment and experience but also allow players to participate in the creation, governance, and revenue of the game, achieving a higher sense of autonomy and belonging.

- Liquidity and value enhancement of game assets and rights. Through technologies such as cryptocurrencies and smart contracts, game assets and rights can be to-kenized and NFTized, thereby achieving higher liquidity and value enhancement. Players can freely buy, sell, exchange, borrow, mortgage, and other game assets and rights on different platforms and markets. They can also vote and make decisions on the development direction and rules of the game by participating in DAO and other organizational forms.

- The construction and expansion of the game ecosystem and community. Cryptocur-rency and blockchain technology can also promote the construction and expansion of game ecosystems and communities, such as through incentive mechanisms, partner-ships, open platforms, etc., to attract more developers, players, investors, media, and other participants to Join the game ecosystem to form a virtuous circle of network effects. At the same time, establish an active and interactive game community through social media, forums, chat rooms, and other channels to enhance trust and consensus among players.

The future trend of cryptocurrency in the field of Gamefi is diversification, val-ue, and socialization. It will bring new opportunities and challenges to the game industry, and will also provide players with more choices and possibilities..

3.3. Analysis of the application characteristics of cryptocurrency in Gamfi field

3.3.1. Advantages of cryptocurrency in the Gamefi field

Gamefi is an emerging concept that combines games and finance. It uses blockchain technology and cryptocurrency to provide players with new revenue models and value-creation methods. Cryptocurrency has the following advantages in the Gamefi field:

-Good liquidity. Cryptocurrency can be used as a common currency in the game to achieve cross-game, cross-platform, and cross-chain circulation and transactions, which improves the player's asset liquidity and flexibility.

- Incentive mechanism. Cryptocurrency can be used as an incentive mechanism in the game to reward players for participating in various activities in the game, such as fighting monsters, mining, cultivation, competition, etc., realizing the play-to-earn model, and allowing players to gain income.

- Enhance the sense of belonging. Encrypted currency can be used as the governance right in the game, allowing players to participate in the decision-making and devel-opment of the game by holding or pledging encrypted currency, which enhances the player's sense of belonging and participation.

- Normalization of assets. Encrypted currency can be used as the value anchor in the game, allowing players to exchange or purchase encrypted currency to obtain other assets in the game, such as NFT, props, equipment, etc., which increases the player's willingness to invest and collect.

To sum up, cryptocurrency plays an important role and value in the Gamefi field. It not only provides players with more choices and possibilities but also pro-vides game developers and operators with more innovations and opportunities.

3.3.2. Disadvantages of cryptocurrency in the Gamefi space

Gamefi is an emerging model combining blockchain technology and games, aiming to provide players with more autonomy, income, and fun.

Although blockchain technology adopts cryptography-related technologies and has high security, the entire blockchain network still has weak links in terms of pri-vacy and security. Data privacy concerns. Take Bitcoin as an example. Bitcoin uses addresses for transactions, which is anonymous, but the transaction records are com-pletely open. All transaction records of an address can be found. Once the address is linked with the real identity, the consequences will be very serious [5].

Therefore, cryptocurrencies also have some disadvantages in the Gamefi field, such as:

- High volatility. Liquidity comes with risk. The price of cryptocurrency is affect-ed by various factors such as market supply and demand, policy, technology, etc., and is prone to large fluctuations, which brings risks and uncertainties to players.

- High transaction costs. Cryptocurrency transactions need to be verified and con-firmed through the blockchain network, which consumes a lot of computing re-sources and electricity, resulting in high transaction costs and affecting players' revenue and experience.

- Poor compatibility. There is often a lack of interoperability and standardization between different cryptocurrencies, which brings difficulties and troubles for players to transfer assets and data between different Gamefi platforms.

- Low security. The storage and transaction of cryptocurrencies rely on sensitive information such as digital wallets and private keys. Once lost or stolen, players may face irreparable losses. In addition,

some malicious developers or hackers may use loopholes or attack methods in the game to steal or destroy players' assets and data.

-Easily hyped.Gamfi, an online game with a simpler economic model, is a magnet for speculators, who pour money into virtual currencies not to play the game, but simply to buy them low and sell them high to make a difference. These actions can lead to rapid price bubbles, disrupt economic models, and shorten game life cycles

To sum up, although cryptocurrencies have some advantages and potential in the field of Gamefi, there are also many disadvantages and challenges. Therefore, when using cryptocurrency to participate in Gamefi, you need to pay attention to assessing various risks and take corresponding precautions.

4. Discussion

4.1. Make recommendations for the shortcomings of cryptocurrencies in the field of Gamefi

In view of some shortcomings of cryptocurrency in the Gamefi field mentioned above, the following suggestions are made:

- Increased stability. The volatility of cryptocurrencies can be reduced and players' confidence and sense of security can be improved by introducing stable coins, an-choring fiat currencies or physical assets, etc.

- cut costs. By optimizing the design of the blockchain network, adopting layered or cross-chain technologies, and improving transaction efficiency and speed, the trans-action cost of cryptocurrencies can be reduced and the player's income and experi-ence can be improved.

- Improve compatibility. It is possible to improve the compatibility of cryptocurren-cies and increase the choice and convenience of players by developing unified stand-ards and protocols, supporting the interconnection between multiple cryptocurren-cies and game platforms, and promoting the liquidity of data and assets.

- Enhanced security. By adopting more secure digital wallets and private key man-agement methods, adding authentication and authorization mechanisms, monitoring and preventing abnormal behaviors and attack methods in the game, etc., the securi-ty of cryptocurrencies can be strengthened to protect the rights and data of players.

4.2. New scenarios for cryptocurrency applications in the virtual world

Cryptocurrency has broad application prospects in the metaverse. In addition to the emerging Gamefi (game finance) field, there are other potential directions, can include:

- Social Networking. With the rapid development of the mobile Internet, online so-cial networking has become an important way of communication between people. Especially in recent years, social networking platforms such as Weibo, Twitter, and Facebook have gained huge commercial value by virtue of their huge user groups, but the active users who contributed to the platform and the publishers of high-quality content have not received much attention. There are benefits. In addition, in the traditional network social platform, the data generated by the user on the plat-form is stored by the central server, and the platform can obtain all the information of the user. This centralized data storage method has user information leakage and malicious data. potential for tampering [6].

Based on the above problems, users in the metaverse can conduct social activi-ties through cryptocurrencies, such as rewards, donations, voting, betting, etc. These social behaviors can enhance the interaction and trust between users, and can also motivate users to create more valuable content. Cryptocurrencies can also serve as governance tools for social networks, allowing users to participate in decision-making and oversight.

- Education and training. Blockchain technology, as the underlying technology of cryptocurrency, is not only increasingly used in financial and other fields, but also has great application potential in the field of education. It is expected to play an important role in the construction of Internet + education ecology and promote the reform of the education system. [7]. Therefore, cryptocurrency has a broad prospect in the education neighborhood. Cryptocurrencies can be used for educational pay-ments and rewards. Education fees refer to tuition fees, course fees, examination fees, etc. paid by students or parents to educational institutions or teachers. Crypto-currency can reduce payment costs, improve payment efficiency and security, and also enable cross-border payments, and promote international educational exchanges and cooperation. Educational awards refer to incentives or rewards, such as certifi-cates, medals, etc., issued by educational institutions or teachers to students or other participants. Cryptocurrencies can digitize, standardize, and verifiable these re-wards, increasing their value and trust.

In addition to this, cryptocurrencies can also be used for the sharing and ex-change of educational resources and services. Educational resources refer to content, data, tools, and other resources related to education, such as courses, teaching mate-rials, videos, test questions, etc. Educational services refer to education-related ac-tivities, consultation, tutoring, and other services, such as online courses, homework tutoring, study plans, etc. Cryptocurrency can realize the automatic transaction of educational resources and services through smart contracts, ensuring fair and credi-ble transactions. At the same time, more people can be encouraged to participate in the production and consumption of educational resources and services through the token economy, forming an open and shared educational ecosystem.

In short, cryptocurrency has a diversified and innovative development direction in the metaverse, which can not only improve user experience and participation but also promote the prosperity and progress of the metaverse.

5. Conclusion

5.1. Risks and challenges of crypto-currency adoption in the metaverse

Through research, we found that in the metaverse, cryptocurrency can be used as a safe, fast, and convenient payment method. Compared with traditional payment methods, cryptocurrency payments are faster, transaction fees are lower, and due to the blessing of blockchain technology, the transaction process is also more secure and reliable. At the same time, the decentralized nature of cryptocurrencies also enables freer transactions and interactions in the metaverse, without being restricted by countries or regions, which is more in line with the concept of globalization and decentralization of the metaverse.

However, we are also aware of some shortcomings of cryptocurrencies in the Metaverse. First of all, due to the instability of the cryptocurrency market, the price of cryptocurrency fluctuates greatly, which will also affect its application in the metaverse. Second, the blockchain with Bitcoin as the token adopts a new privacy model, that is, the details of the transaction are all public, and the user is anony-mous. In addition, the Bitcoin blockchain system contains a large amount of user data, which is publicly available, providing researchers with unprecedented opportu-nities to mine and analyze blockchain data. However, due to user anonymity and uncontrollable user behavior in the decentralized group-oriented system, and the current lack of effective monitoring in the blockchain ecosystem, the blockchain platform has become a high incidence of various cybercrimes [8-10]. Due to the anonymity of cryptocurrencies, there are certain security risks, such as money laun-dering and fraud. Finally, the application of cryptocurrencies in the metaverse re-quires a more complete technology and governance system to ensure its security and sustainability.

5.2. Deficiencies and future research prospects

Therefore, future research plans include the following aspects: First, it is neces-sary to deeply study the operation mechanism of the cryptocurrency market and explore how to stabilize the price of the cryptocurrency. Second, it is necessary to strengthen the supervision and governance of cryptocurrencies and establish a more robust security system. Finally, it is necessary to further study the application sce-narios and business models of cryptocurrencies in the Metaverse to provide support for their better development.

Although this article attempts to conduct a comprehensive and in-depth analy-sis of the application of cryptocurrencies in the metaverse, there are still some shortcomings. First of all, the research scope of this paper is limited, and it does not touch on other metaverse fields that may be related to cryptocurrencies, such as education, medical care, etc. Secondly, the research method of this paper is mainly based on a literature review and case analysis, lacks empirical data and quantitative analysis, and cannot fully reflect the actual effect and influence of cryptocurrencies in the Metaverse. Finally, the research perspective of this article is relatively lim-ited, without taking into account the differences and characteristics of culture, poli-tics, economy, law, and other aspects of different countries and regions. Therefore, this article is for reference only, hoping to attract more scholars' and practitioners' attention and research on the application of cryptocurrencies in the Metaverse

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