Cryptogames as Drivers for Blockchain Application Development

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Abstract. In this chapter, we outline reasons why cryptogaming, like cryptocurrencies in general, is an area of special interest for blockchain research. We suggest that cryptogaming is a field that drives forward the development of blockchain applications. Games require continuous interest, added value through interaction, and sufficient content in order to stay viable as a business model. They therefore challenge the ways in which we commonly view blockchains as first and foremost trust technologies and sidesteps from traditional banking, contracts and insurance, and call us to envision a much wider application of the technology than is currently being discussed in both popular media and research.

Keywords: Cryptogames, Blockchain, Non-fungible tokens, Value propositions

1 Introduction: Serious and Not-so-serious Applications of Blockchain

Blockchain is widely understood as a universal technological enabler of trust due to the transparency and immutability of data it conveys. There is no need to appeal to a third party as a trustee to verify a transaction between two agents on blockchain, nor supposedly any question about ownership (see e.g., [18[). For this reason, public discourse labelled blockchain technology as "the trust machine" [6]. Some of the nuance has been lost in this discussion, though: third-party verification is not required in this particular configuration, but the human factor of trust remains. Trust between human actors is crucial in situations such as 'hard forks', operating cryptocurrency exchanges, initial coin offerings, and acknowledgement from traditional financial structures [4, 31].

Cryptocurrencies have gone a long way from the crypto-anarchic intentions of the original Bitcoin paper [20] to professional trading instruments such as the JPM Coin developed by J.P. Morgan [15]. Today, ongoing blockchain development projects aim to enable traceability and proof of ownership to complicated spheres of operations such as land registry [22], identity management [9, 23], and information management in supply chains [16]. There is yet another growing phenomenon within blockchain

applications: the so-called cryptogames. For the most part, they are ignored – or at least overlooked – in otherwise very thorough blockchain research (see [27] for an example). This appears to be because they come from a non-serious direction and are not seen as relevant for societally or financially oriented research on topics such as security tokens, altcoins or smart contracts. However, these "leisures of blockchain" [3] may be significant from the sociological and psychological point of view, and furthermore, important in introducing blockchain applications to the wider public.

In this brief chapter, we outline reasons why cryptogaming, like cryptocurrencies in general, is an area of special interest for blockchain research. Our starting point is the notion that cryptogaming is a field that drives forward the development of blockchain applications, and that games as an area of technological innovation and popular culture are ideal for "public testing" of new technologies. Games require continuous interest, added value through interaction, and sufficient content in order to stay viable as a business model. They therefore challenge the ways in which we commonly view blockchains as first and foremost trust technologies and sidesteps from traditional banking, contracts, and insurance, and call us to envision a much wider application of the technology than is currently being discussed in both popular media and research.

2   Cryptogames

Cryptogames are digital games the designers and publishers of which claim to provide additional value to their users or developers from one or more aspects of the blockchain technology. These aspects, as observed at trade events and on game developers' and games' home pages can be, for instance, permanent ownership of non-fungible tokens (in the form of items, creatures, etc.), transportability of non-fungible tokens to other games, mining of cryptocurrency through play, or the ability to use one's cryptocurrency acquisitions for play instead of spending them on illegal Cryptomarkets or taxable currency exchanges.

So far, cryptogames have manifested mainly in the form of casino-type games, collectible-based games, and attempts at recreating the traditional genres of gaming (massively multiplayer online games, first-person shooters) through adding blockchain-based value to them [24]. Similarly to cryptocurrencies, crypto-collectibles "reveal" their value in trading and may eventually become another form of investment. However, the focus on their potential as investments may overshadow their entertainment value (see [8]).

Cryptogames are one of the key innovation areas in the development of blockchain technologies. Their innovativeness is based on the requirement of continuous appeal to users and players, as well as their emerging, more or less functional business models [25]. Most developers of blockchain applications do not have to put efforts on user appeal, because they target very specific audiences or a specialized user base to begin with. In contrast, a game needs to be playable and interesting for as many people as possible, and especially multiplayer games online depend on the number of players willing to dedicate their time and effort to gameplay. The popularity of games, in general, is constantly jeopardized by play being a voluntary activity, competition from

other games and other ways to enjoy leisure, and fluctuating user bases which make the focus on online games a risky business.

Many cryptogames rely on the existence of popular cryptocurrencies or have their own currency as either proofs of work or as added value, supposed or real. One such example is *Axie Infinity* [26], a relatively popular game about training small creatures to engage in combat with each other. These breeding and battling mechanics make it possible to earn a variety of blockchain-based tokens in the game; however, the game runs on Ethereum, and a new player needs to buy a starting set of digital creatures with Ether. Therefore, all players must pay the "entry fee" when joining in, by acquiring the necessary currency, but on the other hand the obligation to use such currency may drive players away even before they try out the game itself [25]. In essence, as the pre-conversion of players into paying customers exists already at the entry level of such cryptogames, the business model of these games needs to be focused on player retention.

Taurion [29] is an example of a game that presented its players with a pervasive online world of planetary exploration and conflict. The company, however, built its public presentations upon the promise that the value of the game would be based on permanent ownership of items via non-fungible tokens, as well as on an integrated alt-coin that the players could earn and use. The question regarding this type of a business model then becomes whether enough people are willing to play the game, as with any MMO (see[17]). Xaya also developed the official *Soccer Manager Elite* for the British game provider. In that game, blockchain is used to manage the ownership of shares in soccer teams and dividends received [30].

For player retention to work as intended for the company, there needs to be a sufficient amount of interesting play (play value) for the players of a game. Neither novelty value nor sunken costs are able to keep players interested in the longer run [10]. The challenge for the nascent industry is to keep the game interesting and profitable, while avoiding direct pay-to-win mechanics (i.e., the ability to get an extreme advantage in competitive play by paying real money to the company; [12]). Axie Infinity, too, has raised the question on whether it has been too focused on the pay-to-win (or "invest to win"[19]) mechanic, or whether it is in fact a nicely playable way to get introduced to non-fungible tokens.

The question of sufficient interest and demand remains valid. Outside of certain countries with strict gambling laws, for example, cryptocasinos are unlikely to hold mass appeal. It is easier to speculate with the value of something like Bitcoin than it is to both speculate with its value and simultaneously use it on a virtual roulette. Here we have two significant cases to present: *Flow* and *Terra Virtua*. Flow is a blockchain platform developed by Dapper Labs [5], the company that also owns and updates the so-far most successful cryptogame CryptoKitties. In its current state, the description of Flow suggests that it will not be compatible with the Ethereum platform, but it will instead be seamlessly integrated with Libra, the ambitious blockchain project of Facebook [7]. As the Google login option will be enabled in Flow, the current speculation is that it will likely exist in partnership with large centralized ad-serving platforms than offer an alternative to them in terms of privacy.

Terra Virtua is another example of a blockchain platform that may have an effect on the game industry in the future. Its goal is to create a mass-market ecosystem for digital collectibles, including exclusive offers from major brands. Terra Virtua utilizes the Unreal Engine from Epic Games to develop its virtual world [28]. Terra Virtua's project, like certain attempts at creating blockchain-based yet sufficiently dynamic first-person shooters, point towards the idea that it may not just be technological diversity and innovation, in the form of playability, but also innovative API's, where we will see the true contributions of cryptogames to blockchain development. Other producers, such as Blocklete Games [1], are in turn forming partnerships with media giants to secure themselves the possibility of including cryptopayments backed by more established businesses. This parallels with earlier cooperation between social media platforms or major media IPs and game producers, such as in the case of Zynga (see [11]). The results of these moves remain to be seen – but are certainly worthy of further research.

3   Discussion

Above we have outlined a number of examples of recent developments, promises and challenges, in the cryptogaming sector. Our argument is that the role of games as part of people's leisurely choices and the voluntary nature of gameplay, as opposed to the utilitarian ethos of adopting and using financial and administrative applications, make cryptogames quite different an area of investigation than other blockchain-based technologies. There is no doubt that due to their nature as mass-appealing and low threshold-emphasizing applications cryptogames drive and accelerate the evolution and diffusion of blockchain technologies. Currencies are often binding, if exchangeable, for their owners. The same thing is true for many other non-fungible tokens, from securities to digital artworks. Games add a wild element into this mix, especially when connected to clever new API solutions.

Games also advance or even force technological innovation in this sector. People often have very strong platform preferences on where, when and with what they want to play. In order to collect the necessary revenue to survive as financially viable, cryptogame developers will have to adapt to this and push the technical envelope of the entire sector further. If a large potential cryptogame market was, for example, found to exist on a console environment, we would witness significant adaptive leaps in the same way we are now seeing with decentralized apps. Likewise, we believe that the cryptocurrency micropayment market, still in its infancy, will find its strongest developments in this sector.

Cryptogames are still coming into existence and finding their ways of being financially stable. Many cryptogames on the market today are merely copycat versions of previously existing games or variations of early online pet games such as *Neopets* [21], to which blockchain technology is supposed to somehow magically add

significant value. However crude in their execution, cryptogames are, in our view, at the core of this topic, if not the discussion. The way in which they rely upon either cryptocurrencies for their value propositions, or on non-fungible tokens for their uniqueness, means that they are increasingly often cutting-edge applications of blockchain technology – just not very popular ones. The question therefore becomes, In their seeking of sufficient player bases, public interest, funding interest, and user retention, where will they take this technology that can be regarded boring by people not interested in market price investment and speculation?

4   Directions for Future Research

In the final section of our chapter, we outline the value of cryptogames to blockchain development and research, as well as point to potential future directions. With the field still being so diverse with regards to game types and application ideas, it is recommendable to seek out interesting examples of successful and not so successful cryptogames for deeper case studies and development inspiration. At the same time, it is essential to keep an eye out on what else is taking place in the cryptogame development as well as game and blockchain industries on the whole. Understanding cryptogames may not only tell us what blockchain is able to do next, but also what it is not able to accomplish. The voluntary nature of gaming, underscored in this brief chapter, creates an interesting stress test for the adoption of new applications, similarly to the manner in which masses of accumulated digital wealth at exchanges and DAOs created enticing targets for other kinds of stress tests earlier.

The financial and market applications of the technology are already being observed (e.g., [27]), but for a voluntary, playful software to succeed and persist a lot more is needed. A stablecoin may have a backing organization behind it, but games live and die on player interest. Cryptogame companies need considerable numbers of players to create new, constant, emergent value through their gameplay, and thereby retain their users. The games have to be appealing in their content, playability, and business models. This means that the blockchain cannot be just an add-on. It has to produce actual added value to the player as well as to the developer company itself. The added value can be observed in the form of ingenious APIs that make gameplay and token-based content and ownership storage possible, but that is likely to be just the beginning. We regard it possible that for example the forthcoming, interesting options for security tokens are discovered for play, not for more traditional business forms, and then developed further by other types of companies.

One final topic, implicitly discussed throughout this chapter, is scalability (e.g., [14]). For a cryptocurrency, unless one is an idealist interested in changing the entire banking sector, partial adoption at times may be seen as sufficient (e.g., [13]). For a cryptogame to function in business terms, it needs both retention and scalability. So keeping an eye on the first blockchain games that actually reach stable player numbers above a few thousands will, in our opinion, be also a business advantage for blockchain developers. On the basis of these success stories in the future, there will likely be a rush of new research projects explaining the foundations and characteristics of such stories,

in the same way we have seen studies emerging on other types of games. As cryptogames become more popular and their business models begin to be investigated in academic research more widely, we will learn whether their success was something created by the supposed added value of non-fungible tokens, or just solid, good game design.

As the points presented in this chapter arise partially from analysing cryptogames, and partially from critically analysing the marketing hype around them, we look forward to getting challenged in further research. This said, our belief in the value of the games together, as a kind of decentralized tool of their own, remains strong.

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