Usage of Blockchain in Game Industry

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Introduction

Blockchain technology has been able to change the way we live, in more ways than one. The biggest of companies are beginning to adopt it, while even governments are now studying how they can leverage on it to become more effective. But there's a multibillion-dollar industry that's ripe for disruption. Video games…

As a next generation computing platform, blockchain enables entirely new functionalities in the gaming world: first, the ability to trade digital assets between games, and, secondly, the ability to trade digital assets between gamers directly. These two new functionalities offer entirely new open marketplaces and ecosystems, allowing gamers and game developers to usher in a new era of inter-connected games. The new model favors from gamers because there is provable ownership of digital assets the new model is fairer for gamers. The important shift will be the transition from a centrally controlled economy to a free market economy.

Blockchain gaming promises many benefits for the gaming industry, but most of all it benefits the players themselves. Here some of these benefits: true ownership, decentralized games, provably fair gameplay, acquiring crypto through gameplay (play-to-earn), global leaderboards, censorship resistance, and no infrastructure to manage for the developers, these are a few of the advantages.

Revenues of Game Developers

If you look at app store revenues today, the sole game developers are getting crushed by giants, such as King.com, Supercell, and others. In fact, 94% of app store revenue goes to larger players, while small game developers are left with 6% of the pie. With the blockchain introducing new models for both digital ownership and game monetization, the small game developers and gamers will be the ones benefiting from the shift.

Blockchain promises to enable new business models, allowing indie developers to claim a larger fraction of the total revenue pie. More importantly, if the business model is embedded directly on a blockchain protocol level, it allows small game developers to receive a portion of net revenue. Since smart contracts and composability allow for smaller companies to build on top of each other, it requires fewer resources for the ability to participate in game development.

Centrality Problems

Hackers love centralized servers! It's just one stationary target for them, and if they can break the encryption, all assets stored on the server are theirs. Blockchain technology in the gaming industry can change that. When players buy digital collectibles in your blockchain-based game, they can store them securely in their crypto wallets. You will notice that they have wallet for players to store Bitcoin and Ether, and they can secure their in-game assets too. This is one of several benefits of blockchain in online gaming.

Ownership of Assets

Unlike the current scenario where you really do not own your in-game purchases, a benefit of blockchain in gaming is that players own their assets. A blockchain-based game will use smart contracts to govern transactions inside the game, and that makes the difference. Smart contracts are executed automatically upon fulfillment of conditions coded in them, and the result is irreversible. When you launch a blockchain-powered game, all in-game assets that your players bought using smart contracts are transferred to their public addresses. Smart contracts also allow for full transparency and every player can view the rules. Smart contract execution results are recorded in a decentralized blockchain, and those records are immutable. No centralized agent can change the public address where the assets are stored, hence no one can change the ownership of the in-game assets.

Barriers to Blockchain Games

Scalability

The primary obstacle facing the intersection of blockchain and gaming is very clear, scalability. The same problem is that the broader industry is inhibiting the sustainability and actual usefulness of current blockchain-based games.

Centralized games and gaming platforms have clear advantages over blockchain-based games right now. However, interesting hybrid solutions such as Ethereum-based Gods Unchained may provide some insights into how centralized and decentralized models can be combined. Gods Unchained runs on a centralized server and is powered by Unity, indistinguishable in gameplay from many games today; however, the cards are non-fungible ERC-721 assets on the blockchain that can be traded in decentralized marketplaces.

Speed

When it comes to blockchain for gaming, perhaps one of the most significant problems so far has been speed. These days, everyone wants a quality, state of the art gaming experience that doesn't lag or provide any issues with speed and pacing. The Ethereum blockchain is quite fast, but with a block time of 17 seconds, games built on the blockchain are essentially restricted to progressing at least three times per minute and that is assuming the blocks are not full causing even more delay. When you take game formats that require consistent interaction between players into consideration, you will find that operating with the Ethereum blockchain as an interface just won't be possible.

In the following section, we will examine the companies and platforms that claim to solve these problems and identify the negative aspects of these projects. Finally, we will present our own solution proposal.

Literature Review

Xaya

XAYA is an open source project maintained by Autonomous Worlds Ltd. This project is mainly about creating fully decentralized, autonomous games where players can expect 100% uptime and have fair gameplay with true ownership of their in-game items. XAYA aims to provide those through a single, custom, blockchain-based platform:

- Truly decentralized massively multiplayer Decentralized Realities (DRs).
- True and fair virtual item ownership with simple and safe trading and sharing.
- Rapid and cost-effective game concept to market for a wide range of new massively multiplayer games.
- Provide tools for asset trading for new and existing games.

In 2013, the XAYA team developed a game named Huntercoin, which is the world's first decentralized massively multiplayer game, built entirely on the blockchain and human mining permissible cryptocurrency.

XAYA addresses both the existing gaming and cryptocurrency markets and further creates an entirely new market in the process through games created on top of the blockchain. This new market is attributable to the creation of new virtual universes and item trading possibilities that are substantially deeper and more flexible than other emerging and simple trained systems using smart contracts.

XAYA targets both developers and gamers. The XAYA team aims to empower a large proportion of new developers who find taking their game visions to market challenging because of time and financial constraints to rent a server. So, XAYA aims to democratize game development. Through the creation of a virtual item trading and sharing platform, the XAYA team wants to allow players to generate real world value or capitalize on previous gaming achievements in new games through the trade of virtual items from one game to the next. Therefore, players will be flex, can trade items from different games. This is achieved through the adoption of XAYA tools and applications by gamers and existing developers and studios. XAYA team solved the problems defined for developers by appropriate developer tools and using the blockchain to create decentralized realities, with a 24/7 uptime. The costs and setup time associated with servers or cloud-based services are eliminated, as are the recurring costs, such as user account management. However, there are technical challenges relating to scalability associated with increasingly rich and complex universes within MMO games, as well as scaling challenges associated with cryptocurrencies and asset storage ledgers. According to gamers, the time and effort expended by the gamer could be rewarded beyond simple enjoyment alone and through the exchange of in-game virtual items for real world value or for virtual items available in another game. And gamers need secure virtual asset ownership with secure social networking. But there are two challenges. The first challenge is that a truly scalable and real-time asset storage ledger is required for the gamer independent of games they play. The second challenging requirement is to create a means of managing ownership and sharing in increasingly complex game universes, like in an MMO game. Over time and given the likely high value of many virtual assets and the gameplay itself, it will be critically important to ensure provably fair gameplay and provably fair item acquisition, which is not addressed in other emerging asset trading platforms.

Scaling is a major difficulty for blockchains and particularly for massive game worlds. The XAYA team has overcome this with breakthroughs in trustless off-chain for games (Game Channels) and Ephemeral Timestamps.

Key Technologies

XAYA uses a cryptocurrency named CHI which is a fork from Namecoin. CHI is based on proof-of-work (PoW). Player accounts and the most important game data are persisted with a decentralized name/value store built directly into the blockchain. Atomic transactions in XAYA allows trustless trading of game items, game-specific currencies and whole game accounts for CHI to enable a thriving economy on top of the XAYA platform and ensure demand for CHI. XAYA improved the payment channels in Bitcoin that can be applied to game moves between multiple players off the blockchain and thus aid in scaling XAYA to its global target size with Game channels. The same concept can also be used for shards of a global game world to enable limitless and near-real time gaming on the blockchain. If disputes arise in a game channel, transactions on the main blockchain need to be made in order to resolve it by the help of Ephemeral timestamps. By mixing the time-stamping property of a blockchain, Merkle-ized hash commitments, amortized mining incentives, and fraud proofs in a clever way. Developers of XAYA have developed a new protocol that ensures that the occurring transaction fees can never be a loss for any honest participant.

Pros and Cons of Xaya

Pros

1. Transactions are at real time speed, because of game channels (similar to payment channels).
2. Provides trustless, serverless, and provably fair gaming platform which is open source and free.
3. Let's gameplay completely be on blockchain.
4. Allows creation of Tokens.
5. Has its own blockchain (XAYA) and currency (CHI).
6. Project is over 6 years old, started in 2013.
7. Supports all languages.

Cons

1. It is hard to observe features of XAYA, due to lack of accomplished games. There are only 4 games are shown in the website, but 2 (Taurion, Soccer Manager Elite) of them are not completed and other 2 (Xayaships, Huntercoin) are too simple games.
2. There are limited number of CHI (150,000,000) and only 40% of it mineable.
3. Trading platform is not released yet. Only the diagram and promises are shown in white paper and website.

Wax

WAX is a market service that includes virtual items in video games and all tokenized products. It's developed on EOS Blockchain. The Blockchain game industry is growing rapidly. Therefore, the need for digital products market is gaining the same importance. This digital products market should cover all virtual items. WAX was established to provide this. WAX also has a decentralized marketplace for this. In this marketplace, the trading and production of virtual products takes place in a decentralized manner. Finally, there are decentralized bags that store digital money.

The performance of applications in the WAX block chain has been optimized. To achieve this, the DPoS consensus algorithm is used. This algorithm works decentrally.

WAX uses Byzantine Error Tolerance (BFT) to prevent malicious users and ensure reliability. This structure ensures the safety of the guilds by voting the transactions made.

Wax's Offers

For Developers

WAX supports the VIRL platform. This makes it easier to load digital products into WAX. As a result, more products can be sold more quickly.

Developers can only make money from selling cash items in games. WAX offers developers a way to make money from customers who don't want to spend money. This path can be defined as integrating advertising into the game.

For Users

Customers can easily use WAX. Because the interface is very simple and understandable.

WAX provides a token-based economy. This model includes activities such as betting, prizes and voting. Through these activities, the system pays for itself. Participants are not charged for most general things.

WAX offers users a structure free from malicious work. Provides security.

WAX has made the accounts free for customers. WAX accounts are better, but it is similar to wallets.

WAX uses a micro-service layer called WAX Creator for users to create NFTs.

WAX uses the WAX ExpressTrade micro-service layer to enable trade between digital product buyers and sellers.

WAX uses the WAX Explorer micro-service layer to provide users with the 3D viewing option of digital products.

Hoard

Hoard is a platform that presents four utilizations; Marketplace, SDK, Admin Console, Crowdfunding. This platform is built on Ethereum and Plasma networks. "Hoard token" (HRD) an ERC20 token on the Ethereum blockchain that fuels the Hoard platform.

Nowadays, in-game assets are stored on centralized game server which prohibits any transfer or trade of ownership. Hoard aims to enable true ownerships of in-game assets in video games by the help of blockchain tokens. Players can freely trade their in-game assets. Game developers also benefits from Hoard as taking serve as a fundraising platform by facilitating the creation of their own ICOs. Virtual goods and services can be tokenized fairly and made tokenized for all participants.

Hoard platform provides immutability to user via blockchain technology. That means transactions that already recorded cannot be changed. It prevents from single point failure as

well as immutability. This makes full decentralized the platform. Some cryptographic tools provide security.

There are advantages and disadvantages about Hoard. We can categorize advantages as for developers and gamers.

Developers can benefit from raising funds to develop their games from many individuals by offering them real value.

Hoard platform also founds new ways and improves already in-hand ways to monetize developers' game. Developers make profits from secondary-market transactions besides rental of their game's asset.

In the gamers side, most importantly, they can have true ownerships of digital assets. Their ownership of assets is unconstrained.

Hoard platform is useful for gamers in new and existing games. Because they can easily manage, view and trade their digital assets from different games. One item in a game can be exchanged with items in another game. Also, these transactions are secure, predictable and there is not any third-party involvement.

There are also disadvantages in Hoard Platform. Firstly, and substantially, nearly all services are paid. These are;

- Creating buy, sell, trade or rent orders
- Registering vanity usernames
- Discussing sales advertisements in comment threads
- Reviewing items
- Cold messaging: user A can use HRD to cold message another user B, and user B will receive the HRD if accepting the messages
- Tipping other users for creating good content
- Gifting items

As another disadvantage, when interacting with Hoard Exchange and using functionalities requires HRD tokens. Because these tokens are used to pay for gas cost in Ethereum blockchain.

When users selling their items, they need to provide information of price in a currency in their choice. According to exchange rates the users will always receive HRD in return.

Enjin

Enjin, which has the same name as the company that developed it, is a blockchain game development platform to fund, monetize, and design games, and it provides tools to grow game communities. It was created on Ethereum blockchain. Enjin use the token with same name Enjin Coin (ENJ) which is an ERC-20 token. Basically, ENJ can be describe as the Digital Gold for game assets. With this coin, company provides the real-world value for game assets. Enjin Coin has a total supply of 1,000,000,000 ENJ, but it has only 791,787,740 ENJ in circulation. When users create custom assets, they must reserve ENJ tokens behind their

assets. At the end of this operation, the reserved ENJ token is burned to decrease the supply in circulation. In this way, inflation will be prevented and the value of ENJ will increase.

Platform supports ERC-20, ERC-721 and ERC-1155.

ERC-20 is the token standard to create fungible (having more than one copy) tokens.

ERC-721 is the token standard to create non-fungible (unique) tokens.

ERC-1155 is the token standard that supports ERC-20 and ERC-721 like tokens in one contract.

The platform comprises of the Trusted Cloud, Blockchain SDKs, Platform API, Wallet Daemon, and Efinity. These tools are created for the mass adoption of the Ethereum network. Because Enjin wants developers to focus on making games and use the Enjin Platform in their games with minimal effort.

Tools

Trusted Cloud

Trusted Cloud is the main service of the Enjin Platform; it is a cloud service that handles connections between games and Ethereum blockchain.

Trusted Cloud gathers requests from clients and game servers, and it interacts with smart contracts on the Ethereum blockchain and returns data to the game. Trusted Cloud provides in-built error handling, input validation, and transaction notifications.

Blockchain SDKs

The company provides SDKs for popular programming languages like Java, C# and game engines like Unity, Godot. They work on SDK for Unreal Engine and Lumberyard.

Platform API

Platform API allows developers to query and send commands to the Enjin Platform in order to ease the game development.

Developers can interact with the Trusted Cloud using the GraphQL-based Platform API, which features full integration with the most popular coding languages on the globe like JavaScript, Ruby, Python, Java, Go, Swift, etc.

Wallet Deamon

The Wallet Daemon is a tool that you can use to automate the authorization of transaction requests to and from the Trusted Cloud. Without the Wallet Daemon, developers would need to sign every in-game blockchain transaction via the Enjin Wallet.

Wallet Daemon manages developer's Ethereum address linked to a Trusted Cloud identity. It receives the transaction, which is submitted to Trusted Cloud, signs it, and sends it back to the Trusted Cloud.

Efinity

Efinity is the game-channel network which is on development for performing highly scalable blockchain transactions. Developers are developing the Efinity network on Raiden Network,

Ethereum's version of Lightning Network, and this made the company one of the first users of the Raiden Network technology.

The company claims nearly infinite volumes of transactions can be performed between millions of players and the game server by opening a game channel using the Efinity network.

Other Tools

Enjin Wallet is a secure cryptocurrency and blockchain asset wallet which supports Bitcoin (BTC), Ethereum (ETH), Litecoin (LTC), Binance Coin (BNB), and ERC-20 tokens, as well as ERC-721 and ERC-1155 blockchain assets.

Enjin Beam which allows your phone to scan smarter QR codes and receive blockchain gaming assets directly into your Enjin wallet.

Enjin Mint Shop is a web service to create tokens. This service only allows payments made in dollars.

Enjin Marketplace is a website to trade your in-game assets or tokens.

Platform's Promises and Offers

For Communities

Communities can gamify their website. They can automate rewards to increase user participation and contribution on forums.

For Developers

Developers can create their in-game assets as tokens. Platform provides tools to manage virtual goods. Developers can create subscription-based or time-limited tokens. Also, developers can create website easily which includes online store. There are many APIs and SDKs.

For Gamers

Gamers can buy or sell items with no risk. Every item has own value, so gamers cannot lose all money. Most importantly, it gives the players the real ownership of the tokens.

Problems

There are two systematic problems due to the limited number of ENJ tokens.

1. Enjin Platform allows creating the infinite number of copies of a token but, it is impossible. So, developers cannot tokenize everything in their games. They can only tokenize valuable assets.
2. After a while, the system will become saturated. So, developers cannot use the platform in their games.

In addition, we must trust the Trusted Platform which is a centralized solution. Enjin *developers* claim it is an open-source system but, there is a trust problem.

Finally, the marketplace of the platform only supports ENJ coins. The platform pushes users to use only system money.

Analysis

When we examined the projects, we found that all the projects provided enough and powerful tools for the developers. All the tools developed have been prepared in accordance with the current technology and they are being developed with each passing day. In addition to the tools available to developers, we can say that they have developed many tools and programs for users. These tools will enable users and developers to quickly adapt to the platforms. Apart from these, we observe that projects solve the ownership problem in general and create new ways to make money for indie game developers. However, we also encountered some problems. To briefly mention these problems:

- All projects push to use their own currencies.
- Entering some systems is too expensive.
- Entering some systems becomes impossible to get involved in after a while due to limited system tokens.
- When using trading platforms, users were forced to pay fees with the currencies of the projects.
- Each project has at least one central decision-maker.

In addition to these problems, we have seen that some projects are working on scalability which is a general problem of blockchain. Especially Xaya and Enjin projects are developing solutions in this regard. However, we were unable to access any information about their qualifications since they were not yet in use.

Proposed Model

We believe that the central payment gateways of the projects should be decentralized. All the projects we have reviewed are managing their transactions with their own wallet implementations. These wallets connect to central servers to provide controls and it reduces trust. The main solution for getting rid of centralized payment methods is to ensure that the system can be used through any kind of wallet. For this reason, a general structure can be built using the infrastructure provided by the Ethereum blockchain without including special improvements. This problem can be solved with smart contracts that can be used with other wallet applications.

Cross-chain solutions should be used to support all currencies without using a main currency in the project.

Decentralization of the decision structure should be ensured. Complete decentralization should be provided with a consensus algorithm to be developed in order to get rid of the central decision-makers of the projects.

Conclusion

Obviously, blockchain technology will change and improve games and in-game economy systems. Although the technology is new, we can see that many projects are concentrated on in-game problems and offer solutions with existing technologies, so we can foresee many projects will be developed in this field in the future. But today, we believe that by using our solution, trust-based problems can be solved, and we can offer users more freedom.