

PLAYnetwork

Providing the physical world with digital context

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1. EXECUTIVE SUMMARY

PLAYnetwork's VISION is to enable a world where the physical and digital universes intersect seamlessly. We envision the network to be the backbone that creates entirely new human-computer interactions and redefines our relationship with the digital and physical worlds. PLAYnetwork consists of two parts:

PART 1: PLAYnetwork TOKEN (PLAY or PLAY) which enables physical objects (collectibles, toys, etc.) on the blockchain and a larger ecosystem of social play.

PLAYnetwork-enabled devices can write data to RFID tags using PLAY. This data, along with proof of ownership, is stored on the blockchain via smart contracts. Owners can then control how they store, access, exchange data on the PLAYnetwork.

New and novel applications are introduced by combining physical objects (collectibles, toys, etc) with digital data via PLAY.

First, the PLAYnetwork creates a new dimension of value in physical objects by giving them unlimited digital attributes (dates, owners, points, etc) in physical objects. **You can effectively network physical objects together at a singular protocol level.**

Second, at the application layer, enterprise and consumer users can manipulate and interact with the digital layer to authenticate licenses, customize attributes, transfer ownership, in addition to deriving value from play and collectibility.

Third, PLAY itself acts as a financial store of value inside of objects, fractional or whole. PLAY can add (or subtract) direct, verifiable financial value to rare or collectible objects beyond abstract (rarity, looks), IP, and utility value. Similarly, value of commoditized objects and items can be wholly or fractionally represented in PLAY.

PART 2: PLAYTABLE, a blockchain-gaming console that interacts with RFID-pegged objects. It connects physical objects with digital attributes through RFID and the ERC-721 standard.

PlayTable serves 3 core functions:

- 1) Generation: “mining” of PLAY
- 2) Registration: of PLAY amongst other PLAY-approved devices
- 3) Utility: playing with PLAYnetwork-enabled toys and objects

Users are able to “mine” the 550M available PLAY (55% of total supply) through staking and through playing. Manufacturers, publishers, or super-users can stake the network and are rewarded in various ways through PLAY, discounts, and unique, non-fungible data. End consumers are also able to earn tokens through various means -- pooling, playing longer, competitions, etc.

The token economy designed for PLAY works in conjunction with the intended usage of the token itself.

- 1) Assignment of PLAY into toys and objects reserves them for use, thus removing them from the ecosystem.
- 2) Various incentive mechanisms prevent PLAY from re-entering supply
- 3) Before PLAY re-enters supply, fees are assessed and tokens are “time-gapped” for a period of time

Example usage:

A famous artist purchases 1,000 PLAY from an exchange at \$1.00 per token. The PLAY is assigned a brand (“colored”) and then deposited to the branded toys through a PLAYnetwork-enabled device. Collectors purchase the limited-edition toys for some price.

If PLAY increases to \$100 in value, the collector will face two options: withdraw PLAY or to leave the PLAY in the toys.

The first option gives liquidity, but at the cost of losing the novel collectible value of the toy (withdrawing PLAY makes the toy lose its non-fungible digital aspects). while deprecating the “tokenized” and collectible value of the toy. The second option, while less liquid, still holds the same value of PLAY inside the toy. The collector may even be able to sell the toy at a higher price (depending on its non-fungible and rare nature). Because the very nature of PLAY adds value and also is a store of value, the second option is often more attractive.

2. WHY TOYS?

The wave of consumer-friendly applications like Coinbase reaching #1 Downloaded in the xApple Store is only the beginning of a blockchain future. Nascent implementations of crypto-collectibles and games like Cryptokitties have not only introduced and educated a mainstream audience to the novelty of blockchain, it has also shown that there is a willing audience that is ready to consume new and novel experiences on the blockchain.

2.2 Toys are easy to understand

PLAYnetwork believes that collectibles, toys in particular, in combination with games is going to be the one of the first “killer applications” that will bring blockchain to mainstream adoption. While blockchain is complicated and too technical for the average consumer currently, toys are accessible -- something that parents also understand. Beyond children, the community of collectibles, especially in toys, is sizable.

Toys also solve one of the biggest challenges in blockchain: usability and usage. Functional nature of play gives toys the built-in utility that paves the way for usability. Toys themselves do not require “consumer education” in the same way blockchain does, removing friction from mainstream usage and adoption. Furthermore, the collectible nature of the category also allows for certain monetary incentive structures to be designed within the ecosystem, which is the perfect playground for novel cryptoeconomic models, designs, and experiments.

2.2 Big existing industry

The global toy industry is \$88.1 billion¹, with the US industry alone worth \$20.1 billion dollars.² With the average price of a toy at \$10³, there is an opportunity to bring **8.81 billion toys into the digital world every year.**

Toys are not just toys anymore. The \$88 billion dollar toy industry also has seen cross-pollination with adjacent industries, particularly in the categories of “smart toys” and digital games. The global video game industry is \$78.1 billion,⁴ while the smart toys industry is projected to reach \$9.7 billion by 2020.⁵ Furthermore, the category itself is believed to account for 7.7% of the general video games and toy market in 2016 and projected to grow to 10% by 2018. This is in line with analyst projections of a \$15.5 billion industry by 2022 driven by a combination of hardware and app sales.⁶

¹ <https://www.statista.com/statistics/194395/revenue-of-the-global-toy-market-since-2007/>

²

<https://www.npd.com/wps/portal/npd/us/news/press-releases/2018/toy-sales-globally-and-in-the-us-both-grow-by-1-percent-in-2017-reports-the-npd-group/>

³ <http://www.toyassociation.org/ta/research/data/impact/toys/research-and-data/data/economic-impact-data.aspx>

⁴ <https://www.statista.com/statistics/292460/video-game-consumer-market-value-worldwide-platform/>

⁵ <https://www.statista.com/statistics/320941/smart-toys-revenue/>

⁶ <https://www.juniperresearch.com/press/press-releases/smart-toy-sales-to-grow-threefold>

There are even nascent efforts in combining both categories in Interactive Gaming Toys (IGTs), also known as “Toys-to-Life,” which created massive adoption and usage.⁷ While the category did not exist 5 years ago, IGTs grossed over \$5 billion, led by Disney, Activision, Nintendo, and LEGO. Skylanders sold over 240 million toys since launch in 2011 with sales surpassing \$3 billion.⁸ Disney quickly followed 2 years later with over \$1 billion in revenue, while Nintendo and its Amiibo figurines have surpassed 10.5 million units.⁹ NPD reports that 70% of parents in the US are aware of these toys, with 40% stating they own at least one franchise and 41% of that percent owning more than 1 franchise. The report also points out that parents spent, on average, \$131 on IGT games, characters, and accessories just within the first 6 months.¹⁰

2.3 Toys have multiple utilities

Toys as video games

The value gleaned by parents in a “Toys-to-Life” purchase has a dual nature of both the game and game pieces: it’s simultaneously a video game and a toy. This lends the toys to have more value for the same price. In fact, toys-to-life figures, on average, retail for 30% more than a traditional toy.

Toys as collectibles

Further, toys-to-life figures have also created a cross-sectional appeal beyond children via collectibility. Disney Interactive executive John Vignocchi agrees and states that “52% of our audience is ages 1 to 17, and then the remaining 48% is 18 and up.”¹¹ Similarly, Nintendo wants to take their Amiibo franchise to a younger audience¹², as adults are treating the figurines as collectibles and have created an entirely different ecosystem to consume the IP.

3. WHY BLOCKCHAIN?

Toys have two fundamental utilities: play and collectibility. In the same way that RFID tags have extended the functional value of toys in IGTs by adding video game elements, Blockchain has the potential to unlock data infrastructure features that creates a contextual layer for all participants in the ecosystem (manufacturers, publishers, IP holders, retailers, customers).

⁷ A toys-to-life toy is a toy with an attached RFID tag that can be identified with a “reader” attached to a gaming console

⁸ <http://www.latimes.com/entertainment/herocomplex/la-et-hc-the-player-e3-toys-to-life-20150613-story.html>

⁹ <http://www.nintendo.co.jp/csr/en/report2015/smile/index.html>

¹⁰

<https://www.npd.com/wps/portal/npd/us/news/press-releases/2015/interactive-gaming-toys-viewed-as-positive-investments-keep-families-and-players-engaged-in-play/>

¹¹ <http://www.latimes.com/entertainment/herocomplex/la-et-hc-the-player-e3-toys-to-life-20150613-story.html>

¹² <http://www.mcvuk.com/news/read/will-anyone-win-the-toys-to-life-war/0148453>

Verified authentication of toys

When a product manufacturer releases a product, they want to be in control of the respective toy genre or market they are entering. For most collectors, hobbyists and parents, having authenticated, safe-to-play toys is crucial. Blockchain is the perfect technology to create an authentication mechanism or system that has the following features:

- Identifies when toys are by the real manufacturer
- Identifies features of the toy even when the toy's packaging is missing or removed
- Identifies production batches and enables easy retrieval and self-checks during any product recalls
- Enables hobbyists and collectors to verify the authenticity of their collections or even bring a new dimension (e.g. tracking toys with a specific unique tag, ID, such as the first and final toys in a collection)
- Identifies counterfeit toys as non-authentic if they don't have the RFID identifying feature, and blocks certain play mechanisms

Trustless protocol layer for multiple industries and parties

Developing toys with “video game utilities” requires cross-functional competencies that are cost-prohibitive for most individual actors (IP holder, manufacturer, or game studio). Reported figures have stated that Disney spent \$100M+ on developing the Infinity franchise under a wholly vertical model.¹³ Beyond initial development cost, are considerable ongoing manufacturing costs and inventory challenges associated with developing an IGT experience.

The dominant model at the intersection between these industries has been licensing. If there is a lucrative IP and a desire to create physical or digital experiences, it has been easier for an IP holder to license it away to a toy company or a video game company and collect a royalty than to take on production risk themselves.

PLAYnetwork is a potential solution, behaving as an intermediary platform that can provide a value layer and network for a seamless interaction between multiple industries and parties. This will allow both small and large stakeholders to participate in an ecosystem owned by no singular actor whilst giving all participants innovative physical and digital experiences to build for customers with powerful monetization options.

Verified Experience and Toy History

PLAYnetwork enables data collection and updating that is time-stamped to the activity. Hackers cannot go back in time to create false experiences and activities, and this allows for verified history of the toy. For instance, with a toy and game that emphasizes an experience points mechanism, whereby matches played with the toy will result in level ups, the blockchain will be able to store the history of the experience gains, level ups, matches played in a way that is fully transparent - allowing for these verified

¹³ <https://gamerant.com/disney-infinity-development-costs-100-million/>

experiences to form part of a game's economic stability or competitive integrity.

In addition, the verified toy history lends additional value to the toy in that a storied history, for instance in changes of ownership, can create huge value - a toy that has been played far longer than other toys, is the highest level, has gone into the hands of competitive players, has gone through special one time events, all these unique activities are now stored safely and securely on the blockchain and create value as a result of the past interactions.

Validated Toy value

Collectible card games are the best emphasis for how toys can have validated valuations. There are entire companies and organisations dedicated to verifying the authenticity of cards, checking for their quality, and storing them in secure containers to lengthen their shelf life. With PLAYnetwork and blockchain technology, this can be extended to enable all toys to be easily verified with minimal need to head to a professional. The transparency of the blockchain also allows for collectors to check on the numbers; they now know exactly how many products were created or published and can thus be assured if what they are holding is genuinely a rare item.

Storage of Untamperable Information

Blockchains are tamper-proof; non-trusted individuals outside of the system cannot alter it, and those who can access it have their transactions, history and changes stored permanently. This tamper-proof mechanism creates trust in economies and game systems. A person can be assured that their opponent or their in-game experiences are “real” and cannot be lying, and thus enables increased interactivity wherever the developer needs it to be.

Frictionless cross-platform usage (and monetization) of toys beyond specific IPs

For toy manufacturers, a key part of their business model has not tapped into the post-sale market as it is not in their interests to maintain or sustain toys past the amount of fun it brings to users. However, if they were incentivised through increased profits, the story may be different; if toys could upgrade themselves or have interactions added at a later stage and with an associated price, they would be more than willing to make such an investment. Case in point with the toys-to-life market as previously mentioned - toys that have been equipped to interact with other systems can be continually upgraded to do more things instead of a second release of a product, with the manufacturer saving on material and logistics costs.

Both game assets and toys can be integrated smoothly across different games and bring cross-realm play (e.g. mining ore in a mining game, moving the proceeds into a world where there is a need to use ore to craft weapons, and finally the weapons to be sold into multiple different game realms) - creating a robust and magical economy powered by millions of players of different games.

If the physical goods and toys could have a digital identity beyond just those environments, their digital and physical values would be inseparable. As an example: a toy used to play in one game could transfer as a character piece to another. The toy could also then be scanned by a smartphone to read its stats and stored information. The value of a physical object would come from not just its physical appearance, but its digital attributes and characteristics as well. This opens the gateway to a second reality where people can be part of a second economy outside of their working lives, where they are involved in the creation of goods for an environment they enjoy being in.

Scalability Beyond Toys

Since Blockchain is built at a protocol layer, there is an opportunity to provide any physical object with a digital context beyond toys. There is an equally compelling case to create immutable and traceable digital identities for physical consumer goods, physical certificates of ownership, or digital licenses/goods, etc. This would create additional dimensions of usage, interaction, and context in ways that have yet to be discovered.

4. PLAYnetwork

The PLAYnetwork Token is a blockchain-based protocol for writing and reading data about physical objects such as unique object IDs, IP metadata, and proof of ownership.

The protocol is built on top of the Ethereum blockchain to provide a trustless and decentralized platform for any toy maker, game developer, or consumer to engage with without going through a gatekeeper.

4.1 How it works

First, devices on the network write to RFID tags using the PLAYnetwork Token. The PLAYnetwork leverages low-cost RFID tags as the connecting point to store secure data of physical objects on the blockchain. The value of PLAY comes from its usage as a currency for toy makers and game developers that can be used for any PLAYnetwork services, as a currency in games accepting PLAY, and potentially as a mechanism to vote on future directions the protocol moves towards as it scales.

The PLAYnetwork is a data protocol to provide digital context to physical objects that is permissionless and hardware-agnostic. This means anyone can participate in the network by conforming their toys or games to the protocol and even hardware vendors can create new consoles to enjoy games.

RFID and NFC readers present in modern smartphones, POS systems, and other compatible devices are able to use PLAYnetwork software to read the data. In the

future, it is possible to extend the storage, access, and exchange capabilities of the PLAYnetwork to other tracking technologies such as barcodes, QR codes, or other visual object recognition technologies.

Second, data and proof of ownership is stored on the blockchain. The Play Network registers and tracks ownership and metadata of physical objects through certificates created on the blockchain. It leverages the Ethereum blockchain to provide immutable, tamper-proof, and transparent record keeping.

For toys, this data can be everything from character levels to loot upgrades and achievements hard won in-game. Beyond properties in toys, metadata can also include categories like warranties and IP ownership. This level of open access gives physical objects unlimited data and trackability which provides unique features hard to implement previously like royalties and marketplace analytics.

Third, owners control storage, access, and exchange of data via key.

Storage: The PLAYnetwork assigns unique identifiers to the object and pairs it with the public address of the owner and the public identifier of an RFID tag to create a TOY Token (TOY) on the blockchain. Additional object properties are assigned depending on application use case — including descriptions, timestamps, and encrypted data. The TOY Token itself is a Non Fungible Token able to be sold on exchanges.

Access: PLAYnetwork provides a developer API to read the data associated with a physical object. This software can be incorporated into anything equipped with an RFID reader, including all Android-based phones.

Exchange: PLAYnetwork inherently creates proof of ownership with a user's private key and will also facilitate the exchange of ownership. Using a PLAYnetwork-enabled exchange, buyers and sellers can trade their physical toys and TOY Tokens, their digital identities. This provides immediate value to the time and energy spent playing with the physical toys as gamers can earn certain upgrades or obtain certain rewards based on incentive economics.

4.2 Core Features

4.2.1 Value Creation

First and foremost, the PLAYnetwork is a value layer. The PLAYnetwork creates a new dimension of value in physical objects by giving them unlimited digital attributes (dates, owners, points, etc) in physical objects. You can effectively network physical objects together in at a singular protocol level. This is a generalized layer, that can be applied beyond toys and collectibles.

Networking effect: RFID and blockchain adds a digital layer to physical objects. Utility comes from doing this at a protocol layer; a network is created and utility is derived from a singular language to categorize objects at multiple dimensions beyond physical. The objects and data also benefit from typical network effects experienced by protocols where a bigger network, or more usage makes the network more valuable.

Flexibility / accessibility: a key feature of blockchain is the added context and digital data within physical objects. This unified value layer has never existed before for the physical object. An early version of this is perhaps serial numbers, or UPC codes as they add different dimensions of understanding and context for various incentivized parties. However, as singular protocol on blockchain, the PLAYnetwork creates a unique value proposition beyond the digital context, accessible and manipulatable by multiple parties.

New and unseen properties: beyond the physical, RFID has the capabilities of adding digital properties. With a blockchain layer, properties like immutability, security, and networking become properties of the objects. Various combinations of the properties can pave the way for new usage and applications that has never existed.

4.2.2 Utility

Second, PLAY acts as a utility token. This is the “application layer” where users, both enterprise and consumer, can manipulate and interact with the digital layer to authenticate licenses, customize attributes, transfer ownership, in addition to deriving value from play and collectibility.

Licensing authentication: at a higher level, licensing is an exercise in multi-party ownership and exercise of property rights within parties. Since the PLAYnetwork can store digital data on objects, ownership assignments and interactions are possible in ways that have not existed before.

In the case of toys, rights of IP holders can be abstracted from the manufactured toys, and the data can be manipulated in various ways.

Take for instance a rare Darth Vader figurine produced and registered by Disney with a data attribute indicating that this was the 10th figurine of its kind ever created.

- Users can find out how exactly how many figurines exist and the activity of each figurine via the blockchain - which game it has been used in, how many experience points, etc.
- Disney can set a royalty to allow other game developers to use the figurine that would be automatically paid out via a smart contract
- The consumer can now use all Darth Vader figures in games or experiences that will accept a Darth Vader, regardless of manufacturer
- Disney can also take advantage of digital royalties; set their own royalties every time a character is exchanged -- from owners, to games, to devices

- Analytics around marketplace movement and character customizations can be easily surfaced by Disney or other network participants

The benefit of having this data public on the blockchain is that it can be trustless and incentivize an open sharing of data to improve the network via better games or data-driven marketplace dynamics. One does not have to trust the data given by one company anymore when they say something is “rare and valuable.”

Character customization: in the case of games, the data added to physical objects need not be simply ownership and licensing. Value can be gleaned from giving end users a complete control over how a particular object or toy is customized. Customization, in a way, is how end users can build unique, non-fungible value in the objects and toys they own.

For instance, an end user can create 100 limited edition toys using the PLAYnetwork with various attributes, stats, abilities and powers. Inside a game, the toy can earn experience points, exchange data with other characters, or even earn money. Outside the game, he can add location data, usage data, etc. Or he can add additional non-fungible properties relating to the physical world (e.g. on this day, this toy was painted red because...).

Transfer ownership: tracking ownership transfer of physical objects has proven challenging in the past, especially for low-value items like toys. The PLAYnetwork ecosystem bypasses this by incentivizing attribution into the objects themselves, prompting actors to register on their own accord. While value is added every time digital context is added to a particular physical object, to liquidate or realize the value, users have to register and become part of the ecosystem.

In tracking ownership, PLAYnetwork does not actually track the physical objects themselves. This effectively tackles security issues around counterfeiting or double-spending. The system is oriented around the end user and their individual wallets and/or identities. This system works similar to “two-factor authentication” where no two users can own the same piece of data. The data inside objects are, in a way, sub-wallets linked to an owner.

Collectible + play value: the utility derived by the end user is beyond data. Physicality add a different contextual meaning that gives PLAY-enabled objects and toys “real-world value” — which in the case of toys are collectibility and play value. This dual configuration allows for unique designs in incentive mechanisms through blockchain. In a way, PLAYnetwork-enabled objects and toys leverage the best of both worlds: digital games (blockchain games) and collectible (like Cryptokitties), and physical play (toys) and physical collectibles (trading cards, toys, etc).

4.2.3 Store of Value

Third, colored PLAY itself acts as a financial store of value inside of objects, fractional or whole. PLAY can add (or subtract) direct, verifiable financial value to rare or collectible objects beyond abstract (rarity, looks), IP, and utility value. Similarly, value of commoditized objects and items can be wholly or fractionally represented in PLAY.

Physical objects and collectibles are defined by various characteristics that make up their total value.

- 1) **Collectible value:** these are standard variables not just in the collectible industries, but ones that also drive traditional supply-demand economics in any industry. This includes abstract qualities like rarity, looks, condition.
- 2) **License value:** the toy industry is a great example of value created by licensing. Toys themselves are commoditized value, and the primary way the industry captures profits is through the value created by intellectual property (e.g. Transformers toy) added on top of the manufactured plastic.
- 3) **Material value:** the actual value of the material that makes up the object (e.g. aircraft grade aluminum, or gold).
- 4) **Utility value:** the value derived from the end user being able to use or not use the product (e.g. a limited edition RED-branded iPhone case has utility value, as well as collectible value).

PLAY as a financial store of value can be a characteristic within the object itself. Imagine a limited edition piggyback with \$100 inside or a collectible \$100 bill. In some cases, PLAY can also represent the value of the object that totally represents the collectible, license, material, and utility values. This is particularly important for a new class of objects where there are fungible “mass-manufactured” objects linked with non-fungible digital data. If the collectible, license, and material value of the object is low, PLAY can mostly, if not, wholly represent the value of the object.

4.4 Select applications

4.4.1 Applications in games & toys

Toymakers: whether one is an indie 3D printer or an established toy manufacturer, anyone can plug into the PLAYnetwork and immediately create digital identities for their toys. Every toy that gets registered is immediately usable in PLAYnetwork-enabled games and to sell to an increasing amount of consumers familiar with the platform.

The registration process involves attaching an RFID tag to a toy and then linking a digital identity for that toy on the PLAYnetwork with a smart contract transaction. The toy creator would need pay with Play Network Tokens, which can either be bought on the open market or through our maker fund. Registration can be done with a decentralized application we create, someone else creates, or by interacting directly with the smart contract.

Since PLAY is publicly accessible, toy makers don't need to ask anyone for permission and can independently read the documentation, register their toys, and market and sell the toy in the open market.

Game Developers: studios — small and large — are always looking for a large audience and are usually constricted to the size of the platform they decide to build the game on. Since larger, more established companies dominate the toys, video games, and IGT space, interactions and innovations within each respective industry are limited. There is a massive opportunity in these industries for an open ecosystem of cross-platform games that interact with platform-agnostic toys.

Games built on the PLAYnetwork can use its API to read and write data stored on the blockchain regarding ownership and metadata of toys that consumers already have. Rather than trying to kickstart a new ecosystem for every new game, developers can just focus on delivering a compelling gaming experience using the existing ecosystem of toys.

The PLAYnetwork ecosystem will also make participation as easy as possible with a developer fund for game studios to interact with PLAYnetwork smart contracts for free to write new data to existing digital identities.

This means a game studio can create a fantasy game using existing dragon toys registered on the PLAYnetwork and give them new abilities once activated on their game. These new abilities can be data written on the blockchain paid for with PLAY from the development fund. Once the network reaches critical mass or the development fund runs out, PLAY has to be acquired on the open market which has a limited supply, encouraging early adoption.

As a public good, game studios can continue to build games and benefit from all the activity on PLAY as the ecosystem of compatible toys, hardware consoles, and end consumers grow and want more ways they can use their existing toys.

Consumers: even with no knowledge of blockchain, consumers can benefit from participating in the PLAYnetwork with an ever-increasing amount of toys and games they can play with in addition to full ownership of the digital data associated with each toy.

With their private key, consumers can prove ownership of their toy via the blockchain and that means any achievements or upgrades earned on a toy is theirs and they can sell it to someone else if they so choose to. This means the value of a toy actually grows in value in the after-market where it normally only decreases in value.

Games can be configured to only accept toys that prove ownership so stealing toys won't be profitable since the digital ownership is still based on the original owner's private key.

The marketplace dynamics from having toys that increase in value as they are played would incentivize more consumers to participate in the ecosystem fueling more toys and games to be made in a virtuous cycle.

4.4.2 Applications beyond

While the PLAYnetwork is initially focused on specific industries targeting gaming and toys, our goal has always been to enable a world where the physical and digital universes intersect seamlessly. In the future, we see the PLAYnetwork Token transitioning to a "Product Network Token" with many future applications for this technology to play a part in both consumer and enterprise.

Consumer goods receipts: in a truly digital world, physical receipts as proof-of-purchase may be phased out in favor of digital records maintained on a blockchain. Upon purchase of an item, an Authentic Asset Certificate could be created and assigned to a specific user as a form of receipt. The certificate may store information about that purchased product's warranty and service related information. In this scenario, tokens would function as proof that the purchaser properly took title to the asset and has related ownership rights (e.g. right to transfer).

Products are then identifiable by token without the need to associate ownership with identity. In the case of a product recall, the manufacturer would be able to identify owners of a given product and either send a message to those owners regarding a recall or even make a refund.

Since everything is controlled by software, the digital transfer of assets can happen underneath a vendor's web layer for a seamless user experience. In the consumer good purchase example: a vendor can automatically register a product's warranty upon purchase with the owner, without any user action.

Digital product licensing: PLAY can also be used to track ownership of digital assets — anything from in-game items to media protected by Digital Rights Management (DRM). PLAY simplifies the licensing process so that the blockchain serves as the registry for rightful purchases of software.

A hash of a digital commodity can be used as a unique identifier that can be added to the blockchain and serve as proof of ownership for digital assets. Digital licenses of any

kind for music, applications, video games, etc. can be registered by their respective organization and then made significantly easier to license with PLAY.

PLAY would serve as the backend data validation service, with decentralized applications built on top to handle the actual processing and issuing of assets and royalties. This means even existing DRM solutions can migrate to a decentralized system and that paves the way for a more open sourced approach to digital licensing.

Open tracking of physical goods: When a physical object gets registered with a digital identity, that object now gets an auditable historical log of every transaction that happens to it. Previously this data was locked away by a company and one would have to trust what they said was true. With a public blockchain, anyone can now know this data is the true source of record.

With PLAY, one can enable unique features that were previously hard to implement with the ability to track an object over time and a record of various relationships and owner information.

4.5 PLAY NETWORK TOKENS (PLAY)

4.5.1 Token Overview

- The primary use-case of PLAY is to store value for players and objects to transfer for products and services on the blockchain. PLAYnetwork services will require payments in the form of PLAY, burnt PLAY, or locked PLAY. Participants such as toy makers and game developers will have to buy PLAY on the open market in order to do things like register toys, update their toy data, or access to otherwise restricted functions. Colored tokens can be created by IP owners to be redeemed for specific in-game products and services. These colored tokens can be deposited into TOY Tokens to give them value and potentially unlock gated in-game content.

4.5.2 Token Functions

ERC-20 Compliance: PLAY is an ERC-20 standard token that will be used in several ways by network participants. Building on top of the Ethereum blockchain provides us with a Byzantine fault tolerant blockchain and a Turing-complete virtual machine. What this means is that we can already start storing data on a trustless and decentralized blockchain with a continually improving smart contract ecosystem for network participants to utilize.

Transferring tokens between wallets: The ERC-20 standard interface requires compliant token contracts to have a specific methods of transferring tokens between Ethereum wallets. Being ERC-20-compliant means that PLAY will be able to be listed on 3rd-party token exchanges and used by 3rd-party Ethereum wallet dApps. This increases the liquidity of the token, allowing it to be more easily purchased by users.

Burning tokens in exchange for services: instead of transferring tokens to a service provider, the service provider may accept burnt tokens. Burning tokens removes them from circulation forever which is beneficial to the health of the network.

Locking tokens/ sending locked tokens in exchange for services: PLAY can be locked for a number of years, effectively burning the token for the locked duration, after which they may be unlocked by the token owner. Tokens can be locked to increase the token owner's stake in the network or transferred to a service provider as payment before becoming locked. All payments for services from developers (digital asset creation, licensing rights, etc) will require a percentage of the payments to be given as tokens locked for 2 years. This enables the PLAYnetwork to utilize a time-gapped deficit model.

Verification of stake in network: Locked tokens have another utility as they are proof of a token owner's stake in the network (since locked tokens by definition cannot be transferred or sold). Certain functionality will be only accessible to token holders with a predetermined stake in the network. These include developer-level functions like creating colored tokens.

Creating Colored PLAY: sub-tokens called "colored tokens" can be registered by token owners who have a sufficient stake of locked tokens. Colored tokens are defined as tokens that can only be owned by TOY Tokens. They are not ERC-20 tokens and cannot be listed on an exchange. These tokens can be deposited into TOY Tokens by locking PLAY. Only the Colored PLAY Creator can deposit Colored PLAY, but can be spent by any authorized operator of the TOY Token.

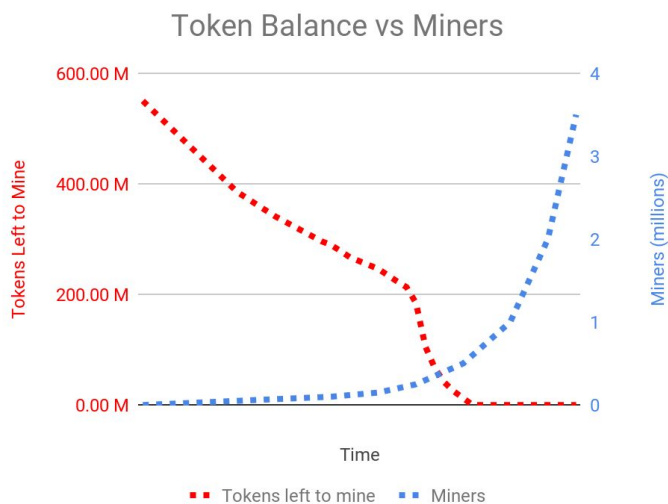
There are three use-cases for colored tokens:

- **In-game Credits** - Spending colored tokens can be accepted as payment for products and services within the colored token creator's economy. In general, only game developers and toy manufacturers will want to invest into creating colored token economies. For example, game developer A might make a colored token named AToken and allow AToken to be spent for products or services in A's games (skins, upgrades, etc). Developer A might even make AToken2 that can only be redeemed in A's second game.
- **Proof of License** - Toy manufacturers can pre-load a number of colored tokens on each of their toys as proof that they were indeed created by the toy manufacturer. For example: manufacturer B verifies their toy authenticity by scanning them. If the toy contains their colored PLAY BToken, they allow the toy owner to play in BToy-only games. Manufacturers can even offer a service whereby they deposit this colored PLAY into an *unlicensed* toy for a "licensing fee".
- **Proof of Rarity** - Toy manufacturers can pre-load a number of special limited-edition colored tokens on a batch of toys. On top of proof of license, these toys will now have inherent value from limited nature of their special tokens inside.

Storing value inside digital assets: colored tokens may be deposited into digital assets stored in the PLAYnetwork. This can be a way for toy manufacturers to add value to their products, or for game developers to encourage players to play their games. Manufacturer A's toys might not be selling well, so A loads them all with \$5 of AToken. Now, the toys can function as gift cards with more redeemable value than their retail cost, creating the proper incentives to sell and increase inventory turn. Another example would be a game developer that offers \$20 of their own colored tokens to the first 1,000 players that beat the tutorial of their new game, at no cost to the developer, except for the initial network stake needed to create the colored token.

4.5.3 Token Supply and Distribution

PLAY is an ERC-20 token with a fixed supply of 1,000,000,000. After issuance, no additional tokens will be created. The large amount of tokens will ensure meaningful transactions can happen on the PLAYnetwork.

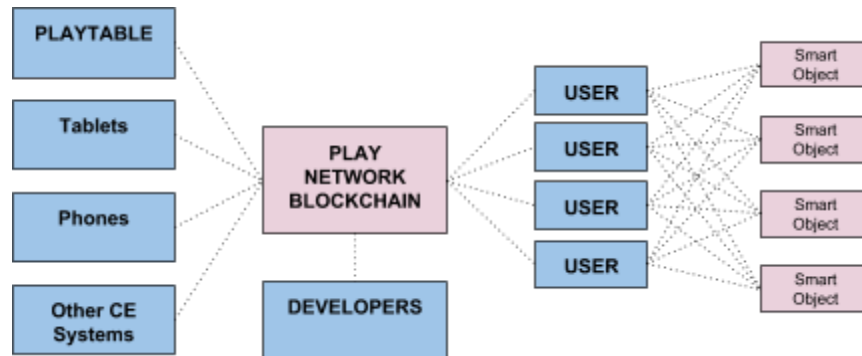


PlayTables will be loaded with “pre-mined” PLAY, as well as a static mining rate. This amount will decrease exponentially for every successive generation of PlayTable. The core focus of this means of token distribution is to ensure a critical mass of devices and users are quickly onboarded to support the network. A total of 550M PLAY will be available for mining. PLAY mining will be used as a reward system for developers and users, to incentivize positive network behaviors.

After the token sale process and the issuance of subsidies, the network will experience an upwards of 20% of the supply of tokens in issuance in circulation. To ensure the appreciation of the network and all its participants, additional incentives (including

some not outlined within this whitepaper) will be implemented to appropriately manage the velocity of tokens (e.g. staking, gamification).

PLAYnetwork acts as a bridge between devices (platforms for mining, registration, and play), users, and objects.

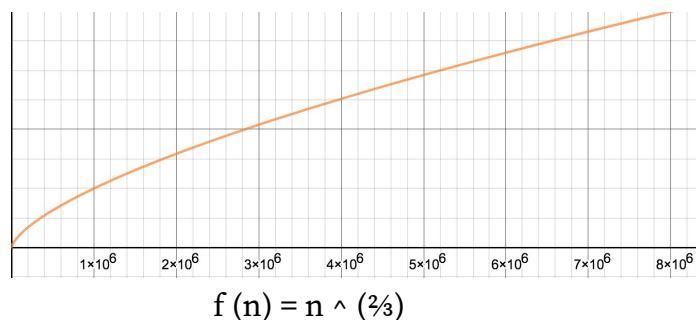


Mining Algorithm

According to Metcalfe’s law, the value of a network is directly proportional to the square of the number of connected users of the system. Incentive mechanisms will jumpstart the network with active consumers, toy makers, and game developers. The PLAY and associated mining devices will be a critical component to early network growth as it acts as the initial platform for reading toys and playing games along with the tokens being offered as a subsidy (via “mining”) to early adopters.

A modified Sigmoid function will be used to calculate the value of PLAY mined on PLAY-enabled devices. The current algorithm is still in development but below explains the thought process behind the framework.

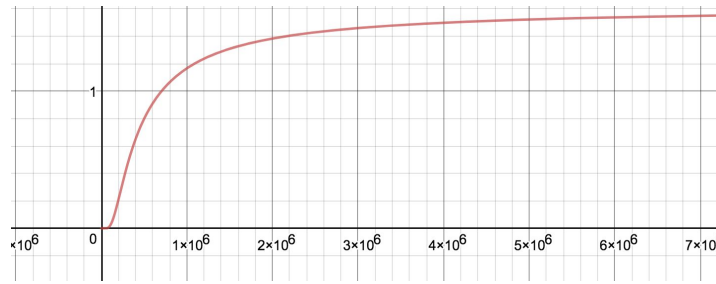
First, we will assume that the value derived by the individual user relative to the network operates under 2 functions. First:



Where:

- 1) $f(n)$ is the number of users that a single user can reasonably derive value from.
- 2) n is the network size

Second the function:



$$s(n) = 1 / (0.25 + e^{-1 + c/n})$$

Where:

- 1) $s(n)$ is the total network value derived from the network (not including the previous function)
- 2) Where c is a modifier that represents the critical mass number for the network
- 3) And n is the size of the network

From these two functions, we will assume that there the floor of value that the a network member derives from the network any any given network size (n) is:

$$v(n) = 1 / (0.25 + e^{-1 + c/n}) * n^{(2/3)} / n_0$$

Under this modified curve, the value derived from the network is negligible until n values of about 200,000.

We can use this equation, with a price modifier p to set a floor to value the subsidies provided by PLAY to the purchasers of PlayTable. In this case:

- If $p > v(n)$, then the subsidy will be valued at p ;
- If $p < v(n)$, then the subsidy will be valued at $v(n)$

This works because there is an inverse relationship between a limited number of tokens given away and the price of the token. As the network size grows, the value and thus $v(n)$ grows. The appreciation of the network means fewer tokens are given away for the same value. This mechanic will ensure that there are enough tokens to “mine” the network until there is a critical mass.

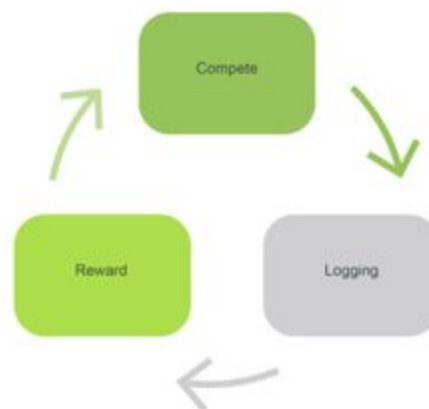
Effectively, the token sale process issuing PLAY will set a floor on the value of the token. While the token sale will raise funds for the further and continual development of PLAY, an additional allocation of the tokens within the company reserve will drive network growth.

Governance

As the PLAYnetwork grows, various issues may arise. For example: The PLAYnetwork might face an increasing PLAY cost that restricts upstarts from participating in the network. By allowing token holders to vote on the Token price, we can ensure that the network participants can tweak the variables to have everyone's best interests in mind. Other areas of governance the community could vote on include a token buy-back program and a decentralized distribution model where participants can decide where a fund of tokens gets allocated towards.

5. TOKEN ECONOMICS

In the past few years, engineer teams in the blockchain industry have been looking for a new token mining mechanism to replace the POW mechanism. The majority of current mainstream blockchain projects have adopted the POW mechanism but have realized the POW mechanism is not energy efficient nor does it create relatively high value. Alternatively, the POS mechanism could be a good option with replacing proof of work with proof of stake. However, the POS mechanism may increase centralization of the distributed architecture of a blockchain network, because the amount of network control of participants is directly proportional to how much they invest. The POW mechanism in Bitcoin created by Nakamoto introduces an economic variable in the real world, incentive mechanism, and breaks the traditional distribution structure. Our original ideas of designing the PLAYnetwork token economy start from increasing energy efficiency and creating commercial value for a blockchain-based project. So far, most of the current mining mechanisms are based on the competition model for logging transactions designed by Nakamoto Satoshi (as shown in the chart below).



All the nodes compete to become the witnesses and log transactions and receive cryptocurrency as a reward, which in turn encourages these nodes to participate in the next round of competition. This competition model forms a perfect economic system and replaces the Proof of Authority. To enable more value in the process, we would

have to build a competition model that invites more participants and can be scaled to create more commercial value.

5.1 PLAYnetwork Mining Mechanism

5.1.1 *Token Distribution and Reward*

For a decentralized blockchain platform, it is impossible to adopt algorithm protocols such as PBFT and RAFT. Tokens used in protocols such as POW and POS have two essential functions. First, the blockchain consensus protocols keep all the nodes on a network and maintain data consistency and accuracy involved in a competition model. Second, tokens are used to pay a transaction fee, which prevents a large number of surplus transactions from clogging the network.

PlayTable as a mining machine

PlayTable is not only a blockchain gaming console but also a mining machine for PLAY tokens. PLAYnetwork will include a simple player ranking system and PLAY token reward mechanism to encourage more users to purchase on PlayTable, play exciting games, and join the network. Both the player ranking system and token reward mechanism can increase the total user numbers and active user numbers. We are striving to build an advanced social gaming platform with a large active user base, which will in turn create compelling future possibilities for featured game developer promotion.

The player ranking system and witness selection

- Game players can earn game points by playing multiple games and participating in discussions and activities on PlayTable. Each player's points will be calculated and collected by the system for ranking on a daily basis.



The ranking is updated every 24 hours and the top 120 players will be selected as witnesses and get rewarded with PLAY tokens on the next day. Each player has to

guarantee a 12-minute fixed block time to qualify as a witness. On the second day, each witness's PlayTable is responsible for generating block and logging transactions. These transaction nodes are randomly arranged. Each witness generates a block within a specified 12 minutes in an order. If a PlayTable fails for any reason and a block cannot be generated within a given period of time, the block generation authority will be given to the next witness on the ranking list for the next time period. In this mechanism, a witness will receive PLAY tokens as a reward. If the number of players is less than 120, some players will have the opportunity to mine multiple times in one day and receive more PLAY tokens.

- The PLAYnetwork token reward mechanism is created on top of the DPOS mechanism. In the DPOS mechanism, witness nodes are elected through voting, and the top nodes with the highest number of votes become the witnesses. In the PLAYnetwork mining mechanism, nodes play games to earn points and the witness selection is based on player ranking. The remaining steps are the same as DPOS. Similar to the consensus mechanism, PLAYnetwork uses transaction fee to prevent large numbers of invalid transactions. During token mining, players receive both the tokens as a reward and the transactions fees in a block.
- From a player perspective, PlayTable operates automatically in the back end and does not require any actions from players. While in actuality, PlayTable functions as an ordinary crypto mining machine. For example, let's talk about players of Monopoly and Legends of the Three Kingdoms on the PlayTable. A player could receive 30 points within a day, 10 points from playing Monopoly and 20 points from Legends of the Three Kingdoms, which then ranks among the top 120 players in a day. For being among the top ranked, this player will receive tokens as a reward the next day. During this process, players do not need to understand anything about how the mechanism runs. They can easily earn PLAY tokens as a reward if they play or win enough to rank within the top 120 players.

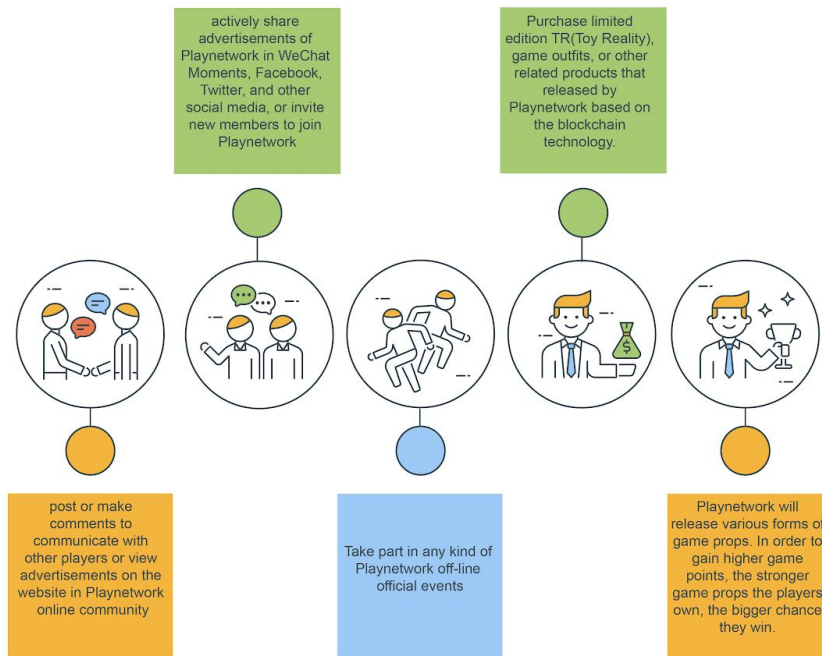
5.1.2 PLAYnetwork 2.0

In the future development, PLAYnetwork will expand upon both the gaming platform and social gaming community. In the second stage of PLAYnetwork development, more application based scenarios will be introduced to the platform. Additionally, the player ranking system will grow based on user base scalability, which will help build a better gaming ecosystem.

- ***Game Players***

During PLAYnetwork 2.0, players can earn regular game points and bonus points through all the following interactions with the platform.

Players can earn game points if they...



- **Game Developers**

- Game developers can pay promotion fees to PLAYnetwork to feature their games. To motivate players and drive traffic to a featured game, PLAYnetwork assigns more points to the game so more players will spend time on the game to earn a higher ranking. For example, players usually earn 3 game points after winning in a specific board game. However, players can earn 20 points by winning in the same game if it is under promotion.

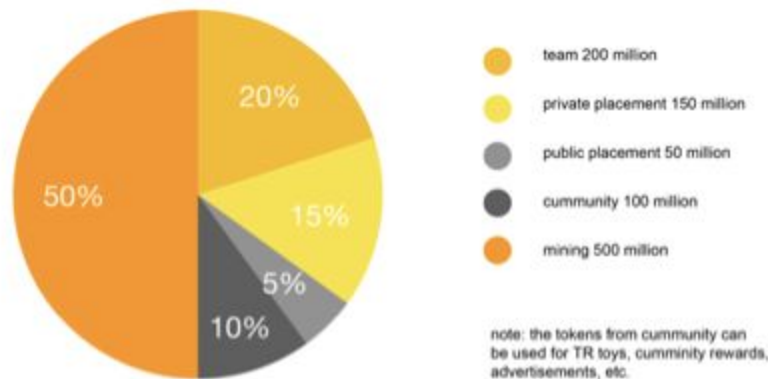
5.2 Token and Profit Distribution

5.2.1 Token Distribution

According to the PLAYnetwork white paper, the total number of PLAY tokens issued is 1 billion. To ensure the interests of the project owner, PLAYnetwork will control around 60% PLAY tokens, either directly or indirectly, in the early stage.

- Token Private Sale: 600 million US dollars, of which 500 million US dollars and equity 1:1 mapping, the remaining 100 million US dollars for token fundraising

- Private token sale has a discount of 20% at 0.04 US dollars per token, public offerings do not have any discounts.
- Public offerings of total 250 million US dollars at 0.05 US dollars per token.
- The initial token distribution is as follows:



In the initial allocation of 500 million PLAY tokens, the project owner directly controlled 20%, plus 10% of the tokens reserved for TR toys with RFID chips. Even if investment from investors are not partially locked, the initial control rate can be maintained at 60%. Since the primary functions of the PLAY tokens are bonus redemption, transfer, and payment of products or services, there is no particularly high requirements for TPFs. Mining rate can be maintained at 12 minutes in one block.

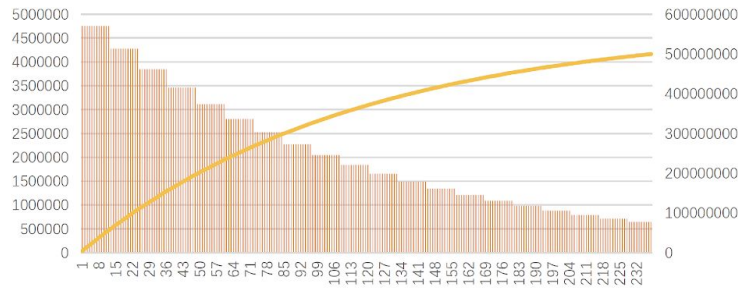
- Assuming that the life cycle of the PlayTable is 20 years, 500 million PLAY tokens should all be mined in the 20-year life cycle of the product, and the following two conditions should also be considered:

- *Control rate*

Maintain the control rate at about 60% for the project owner: when the public accepts the PLAY tokens, the project owner can start selling tokens. The control rate can be less than 60% in this stage. The market incubation period is about 2 to 3 years.

- *Token supply decrement*

Token supply must be controlled to guarantee future price increase. Decrementing token production mechanism is necessary. However, the mechanism should not be similar to the one adopted by Bitcoin, which causes unfair token distribution. Token supply will decrease by 10% every year and reach zero after 238 months in 20 years as shown in the chart below.



- Based on the circulation model above, we set up three token lock-up functions for the PLAY tokens, so the project owner will hold a portion of all mined tokens. We measure different turnover rates (the ratio of the number of mined tokens from player to the project owner to the total amount of new tokens). Even when the conversion rate is higher than 50%, the project owner still has a control rate of around 60%.

Year	New Tokens	New Tokens Under Different Turnover Rates		
		80%	50%	20%
1 st year	5,7024,000	45,619,200	28,512,000	11,404,800
2 nd year	51,321,600	41,057,280	25,660,800	10,264,320
3 rd year	46,189,440	36,951,552	23,094,720	9,237,888

Year	New Tokens	Owner Control Rates with Different Turnover Rates		
		80%	50%	20%
1 st year	5,7024,000	62.05%	58.98%	55.91%
2 nd year	51,321,600	61.86%	59.07%	56.28%
3 rd year	46,189,440	61.69%	59.15%	56.62%

- Players**

Game players are the most essential party in the PLAYnetwork token economy. Game players are involved in both token mining mechanism and circulation, so their

interests must be fully considered. In this project, players mine tokens by playing games on the PlayTable. To provide incentives to players, bonus pool mechanism is added. Token holders can turn in their PLAY tokens to the platform to receive a bonus.

- ***Project Owner***

The project owner has two main sources of revenue on PlayTable, which involves toy sales and the gaming platform. To attract more users to the platform, a portion of the platform revenues will be reserved for bonus pools. Bonus pools are used for token holders to exchange tokens. The project owner can choose to hold all exchanged tokens, license TR toys, generate game skins etc., or sell them at opportune times.

- ***Game Developers***

To start out with, game developers can openly join the platform for free. After the platform has a larger user base, there will be options for developers to feature games with higher bonus points at the cost of some promotion fees.

As an important part of the platform community, game developers allocate 25% of tokens to all game developers in each mining period. The distribution method is based on the ratio of the total points of a single game to the total points of all games in a period. For example, all players of the Legends of the Three Kingdoms earn 1000 total points in this period, all players of Monopoly get 500 points, and all players of Poker get 1500 points. Then the developers of the Legends of the Three Kingdoms will receive 1/3 of the 15% of the mining tokens, and thus Monopoly receives 1/6 and Poker 1/2. Tokens can also be part of bonus pools as extra rewards.

This kind of distribution has two benefits:

- Game developers will build better games to motivate more players to use and get more total points.
- Game developers will spend more money to feature their games and unlock bonus points for their game players.

- ***IP Holders***

In addition to the receiving IP licensing fees from the project owner, IP holders will also participate in the bonus pool in the same way as game developers. 10% of the tokens mined in a game will be allocated to the IP holder. The distribution method is based on the proportion of the total player game points of each game to the total points of all games.

PLAY tokens per block (100%)	Game Players	65%
	Game Developers	15%
	IP Holders	10%

	Project Owner	10%
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5.3 VIP and Referral Program

PLAYnetwork aims to quickly expand PlayTable's market and user base through our referral program. PLAYnetwork will reserve 10% tokens for the platform's VIP subscription service.

VIP Subscription Services

PLAYnetwork will introduce three-tier of VIP subscription services and a referral program to motivate more users to the PlayTable and the community and buy PLAY tokens. Players use fiat money to purchase PLAY tokens and pay for VIP monthly subscriptions to unlock exclusive discounts and special offers. Players can choose to play on PLAYnetwork with a free account or paid account.

Three-tier VIP Monthly Subscription

A paid account has 3 tiers, Adventurer, Hero, and Legend.

- Adventurer: 1,000 PLAY/month
- Hero: 5,000 PLAY/month
- Legend: 10,000 PLAY/month

Referral Program

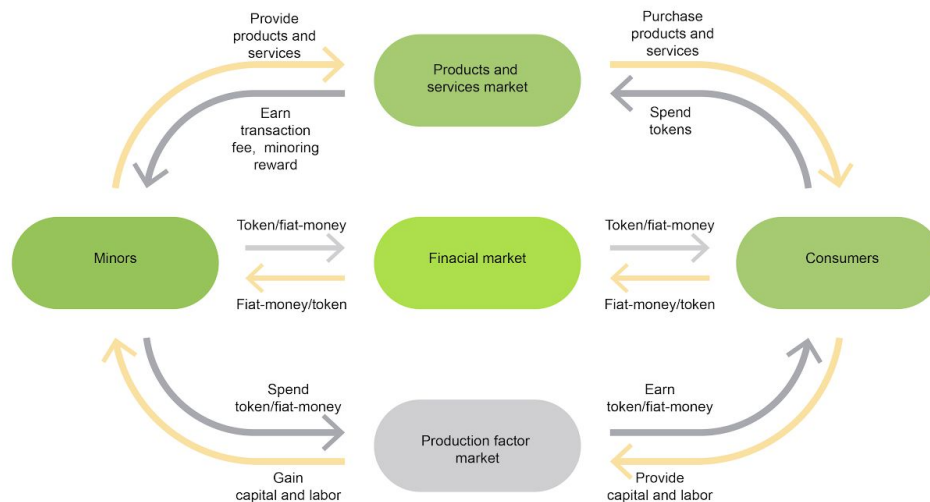
- Adventurer users can upgrade to Hero or Legend by inviting out-of-network players to purchase PLAY tokens and enroll in PLAYnetwork's monthly subscription services.
- Adventurers who invite 10 out-of-network players to register on PLAYnetwork may redeem a 30-day free upgrade to Hero status. Invite 20 out-of-network players for a 30-day free upgrade to Hero; invite more than 50 out-of-network players for a 30-day free upgrade to Legend.
- Hero users invite 20 out-of-network players to redeem a 60-day free update to Legend; invite more than 50 out-of-network players for a 60-day free upgrade to Legend.
- The referral program works with personal referral codes generated by the system, and the system can identify the corresponding referees by the referral code. For each player who is referred to the network, the platform will send a PLAY token reward to their referrer.
- Regular players need to load at least 50 PLAY tokens in their account to become a valid player in the referral program as a referee.

- Hero players can also earn a certain percentage of the PLAY purchased by their referees.

5.4 Token Circulation

A successful blockchain community must have a perfect economic cycle. Tokens need to have practical utility functions. If tokens have weak utility functions or there are no practical applications, the tokens will not circulate. In Bitcoin, for example, miners exchange their own bitcoins for fiat currency, then use them to buy mining machines, hire labors for mining. Consumers use bitcoins for trading (the purposes of a transaction include speculation, payment, etc., the current primary trading purpose is speculation). When a transaction is submitted for processing, miners receive transaction fees from consumers while they earn bonus bitcoin by logging more transactions. Miners may then put its own bitcoin into factor markets and financial markets, thus forming a good economic circulation system.

Since the birth of Bitcoin in 2009, thousands of bitcoin-like cryptocurrencies have been created globally, but in the end, they have gradually disappeared due to insufficient circulations. The primary reason is that one of the most important functions of Bitcoin is speculation, while people do not invest other cryptocurrencies for long-term speculation. Ethereum is widely recognized by the market because it creates ERC-20 smart contract and Ether has a function as gas.



BTC Circulatory System

Most of the current blockchain projects currently issue tokens with primarily payment and products or services purchase functions. These projects are similar and only add weak utilities to their tokens. To achieve an absolute competitive advantage in the market, new token utilities and attributes must be designed.

- **Mining Pools**

The biggest function of Bitcoin is speculation. With Bitcoin as the world's first cryptocurrency, it is hard for other cryptocurrencies compete with Bitcoin when it comes to application and user base. But it is also beneficial to other projects if you consider the fundamental reason for Bitcoin's success, which is profits and interests. If we give more profits directly to users, we can avoid any potential risks for users and use bonus to quickly build a customer base in the early stage.

In PLAYnetwork, 50% of the game and prop sale will be reserved for bonus pools. The platform will convert the PLAY tokens into fiat currency at market price and create bonus pools. All users who hold PLAY tokens can participate in the distribution of the bonus pool. The platform will use 50% its revenue to set up a monthly bonus pool. Users exchange tokens for fiat currency with the platform. Users determine the number of tokens to be exchanged. The bonus is distributed to each user according to the proportion of the number of tokens submitted by the user to the total amount of tokens submitted by all users.

To give a simple example, let's say a player receives 100 PLAYs through exchanges and mining in a month. He has two options for these tokens: he can hold them and sell them when price rises; he can also exchange them for fiat money in the bonus pool. If the player expects the price of PLAY next month at \$0.15, the price of in two months at \$0.25, the current bonus pool has \$10,000, and estimated total token submitted is 100,000, the player will earn \$13 by selling the tokens to exchange, \$16 if the tokens are put in the mining pool, and \$25 if the player waits for two months and sells them. It is very likely that the player will put part of the PLAY tokens to participate in this month's bonus pool and hold the rest to sell to exchange in the future.

Therefore, the bonus pool mechanism in this case has the function of maintaining the PLAY market price. Users make decisions based on the upcoming bonus pool and their expectation for the token market. When token price falls, more tokens will be added to a bonus pool, reducing token supply in the market and possibility of price crash. If token price rises, more tokens will be sold in the market, increasing token supply and controlling any price spikes.

Investor dividend

Any community member holding a PLAY token in circulation can participate in the bonus pool dividend. Since the investor gets a large amount of PLAY tokens during the

first allocation, investors will account for the majority of the shares if no special rules are set, causing price fluctuations.

To protect the interests of all community members, the following rules apply to institutional investors (15% of the total share):

- The tokens of institutional investors are frozen at the beginning and cannot be circulated in the market.
- After the PLAY token is available on the exchange, 30% of the tokens held by institutional investors will be unfrozen.
- 70% of the tokens will be available with linear decreasing amounts of tokens unfrozen in the last 12 months.

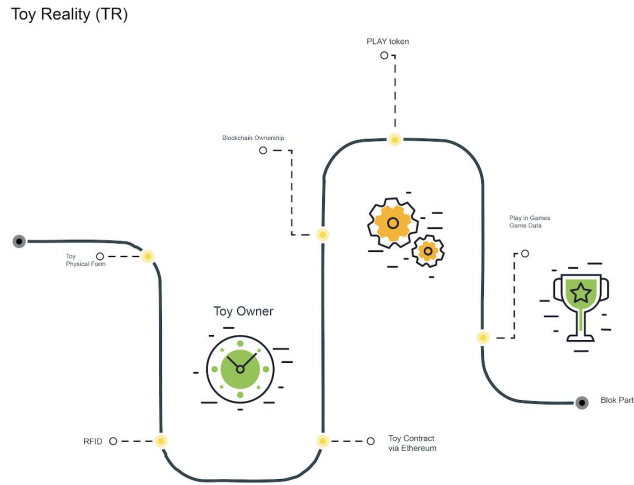
For small and medium investors (holding 5% of the total amount of shares), the rules are as follows:

- Small and medium-sized investors do not have restrictions, and they can unfreeze any number of tokens in the market at any time;
- In order to prevent small and medium-sized investors from selling tokens or participating in dividends, a small amount of transaction fee will be applied every time small and medium-sized investors withdraw tokens. The fee will be decremented, and the earlier the withdrawal, the higher the fee. This is generally limited to two years, 5% transaction fee is applied for the first 3 months, 1% handling fee for the first 6-12 months, no fee after 12 months.

5.5 Toy Reality (TR) Wallet

- ***Toy Reality (TR)***

Toy Reality (TR) is a parallel derivative concept after PLAYnetwork, merging the blockchain and bringing the most popular applications to PlayTable. TR is a new way of interacting without the need for camera intervention to give gamification value to traditional physical objects. TR is an exciting innovation in the traditional game industry, bringing new life through a entire system comprised of diverse applications through blockchain.



- ***TR Wallet***

The differences between TR toys and traditional game toys are the tangible cold wallet and the interaction enabled between toys and PLAYnetwork. Each game on PLAYnetwork can have its toys, cards, and other game items. PLAYnetwork will partner with one of the world's largest hardware companies in the world to manufacture these TR toys with RFID chips so all TR toys and pieces are playable in each PLAYnetwork game.

- ***Physical and Digital Collectible***

A regular toy becomes a TR toy when PLAY tokens are loaded. The more tokens loaded on a toy, the more skills, and higher levels each game character linked to the TR toy will have.

- ***Cryptocurrency Carrier***

The PLAY tokens loaded on a TR toy are out of the token circulation. Depending on the market, a player can choose to hold on to both the tokens and the toys or sell the toys loaded with tokens. Players don't have to withdraw tokens from a TR toy to trade or sell.

The TR wallet function of the PLAY token may become the most important feature in the future. If most of the tokens are reserved for TR toys during the initial allocation phase of the token, it will affect the interests of the community members. To maintain a balance, an ideal way is to incorporate a circulation system. With the bonus pool mechanism mentioned in the previous section, PLAYnetwork will hold a large number of PLAY tokens through bonus payouts. Users need to buy toys loaded tokens, or load

tokens on their toys, the platform can contact hardware manufacturers, hardware manufacturers can buy tokens from the platform and sell to users.

- Other Functions

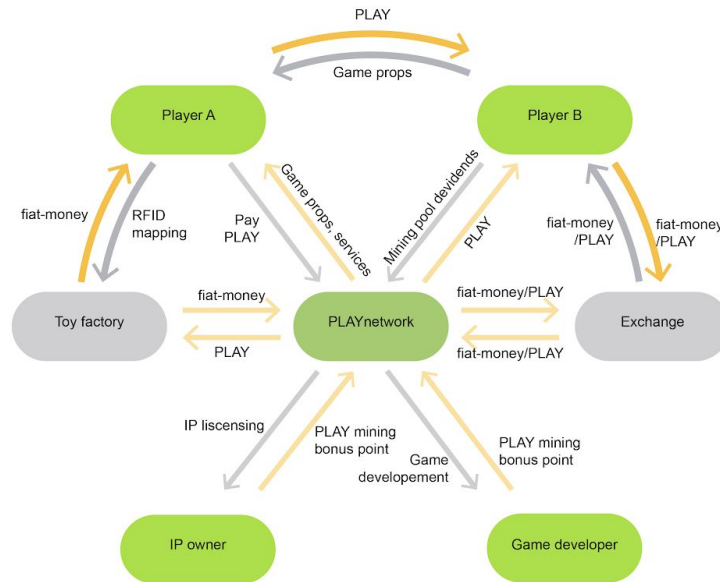
Both of the above functions can maintain the stability of the PLAY token market price to a certain extent. In addition, PLAY tokens also have functions for payment or products and services redemption on the platform.

All PLAY functions are summarized as follows:

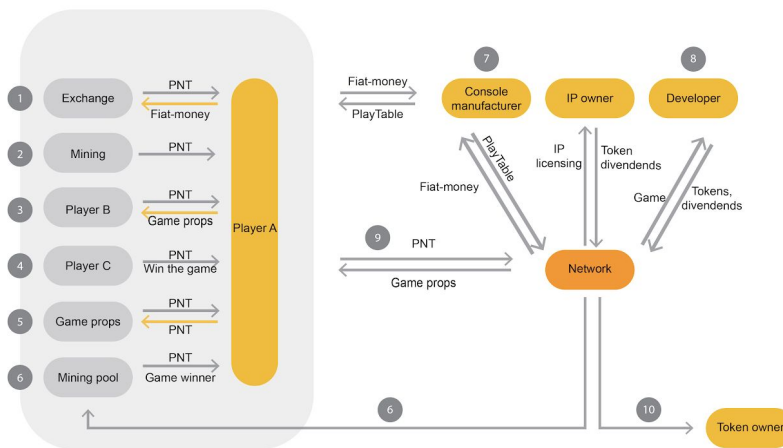
- Use PLAY to create new props, skin, etc., or decompose props, skin to obtain PLAY.
- Use PLAY to bet in games and unlock certain game levels.
- Use PLAY for RFID mapping.
- Purchase game assets such as props and heroes from other players.
- Use PLAY to reserve a bonus pool for gamers.

5.6 PLAYnetwork Ecosystem

Players pay other players the PLAY tokens to exchange props skin etc. or pay the platform for various services; PLAY tokens can also be used to participate in dividends or trading on exchange. Also, toys loaded with tokens (TR toys) can interact with PlayTable and add additional play value to the toy. In the future, the market demand for toy wallets will grow higher, and will bring even more demand to the PLAY token. This part of the token supply is provided by the platform and returned to the dividend mechanism. Any temporary low supply can be solved through exchange trading. This helps form a benign token circulation model. The most critical factor in this mechanism is that the games on the platform are designed good enough to attract a large number of users. Besides, IP holders and game developers also contribute to the platform, so some of the tokens will be allocated to the two interest groups during mining, and the all developers who hold tokens and IP holders can also participate in the bonus pool.



Business Landscape of Playnetwork and PlayTable



Graph11: PLAY Eco-map

- Players can purchase PLAY tokens through exchange trading. For gamers who don't hold tokens, they can directly exchange fiat currency from the platform.
- Players can obtain PLAY through mining and increase mining efficiency by paying extra money or purchasing props. The higher the value of props, the higher the mining efficiency of a player.
- Player sell their props, toys etc. to other players to obtain PLAY;
- Players bets with other players in a game using PLAY. Players who win receive all the PLAY bet;
- PLAY can generate game props, and game props can also be decomposed into PLAY.
- The platform will use a portion of it game sale revenue to create a bonus pool for players, IP holders and game developers. The bonus pool consists of PLAY exchanged from fiat money.
- Game manufacturers sell the PlayTable to players and the platform, obtain fiat money, and do not participate in the token circulation;
- IP holders license the platform for cash (or free), and game developers deploy games on the platform.

Players use PLAY to purchase a variety of products and services on the platform.

6. TEAM

The PLAYnetwork team is composed of UC Berkeley, Stanford, and Harvard graduates who have a proven track record with experience working at Amazon, Apple, high-growth SaaS companies, successful mobile game companies, and entrepreneurial endeavors (building then selling startups). They have patents pending covering critical aspects of human machine interactions based on a digital/physical, virtual/tangible platform, object sensing, recognition and manipulation, etc. All of the team are avid gamers and deep and compelling connections within the industry, as well as garnering respect across the industry for their work.

6.1 Core Team

JIMMY CHEN, CHAIRMAN — Jimmy is a serial entrepreneur and main investor in PLAYnetwork. After selling his first business at the age of 18, he's gained a wealth of experience in business and entrepreneurship spanning across 4 businesses. He's also a member of a \$100M cryptocurrency syndicate and an LP in a blockchain hedge fund. He is a graduate of UC Berkeley.

JOHN DEMPSEY, CEO — After dropping out of college at age 20, he actively traded cryptocurrencies and developed trading algorithms.

SHANE ZHU, PLAYnetwork VP — Shane has wealth of experience in fundraising, manufacturing, and business development. Previously, Shane was the co-founder of Titanium Falcon, a Silicon Valley-based smart hardware company. He led the company to a \$1.5M Series A round, and built the manufacturing and supply chain ecosystem. Before Titanium Falcon, he helped design and build the mechanical systems for the NASA Mars Rover. Shane has a BS in Robotics Engineering from Arizona State University.

KEVIN XU, BLOCKCHAIN — Kevin is currently head of growth at OMG. Previously he worked as a fellow at Felicis Ventures and as an engineer at Stripe. He's a Y-Combinator backed founder with a wealth of experience in blockchain and cryptocurrencies. He has a BS in Computer Science from Stanford University.

SHERMAN MEREDITH, BLOCKCHAIN — Sherman invested in the Ethereum ICO. He has over 8 years of experience in software and game development. In his spare time, he developed an ETH wallet inside the Unity Game Engine.

YE DENG, BACKEND — Ye has over 12 years of experience in software engineering. After working at Huawei, he was the founder of a game studio that developed proprietary lagless physics engine on arbitrary curved surfaces with custom mathematical spatial queries and collider interactions (a very hard problem to solve). Ye has a Masters in Computer Science from University of Kentucky and BS in Computer Science and Technology from Jilin University.

JIAQI WANG, SDK — Jiaqi was the co-founder of MBAville, an educational games studio that published Project Quant -- a game that teaches accounting, economics, and analytics. Jiaqi has a Master of Science in Computer Graphics from Purdue University and a BS in Software Engineering from Beihang University.

JOHN BOHNE, ANDROID — John has been developing Android since its inception in 2007. He has experience with product-oriented, consumer-focused material design and creating mobile apps. He graduated Cum Laude with University Honors in Computer Science, University of Memphis. Github: <https://github.com/John61590>

JASON GE, VP HARDWARE — Jason has over 20+ years of experience as a VP of R&D at Huawei. He also owns a factory in China. He has a degree in Electrical Engineering from University of Electronic Science and Technology.

SAM LEE, RF ENGINEERING — Sam is a highly sought after RF Engineer in Silicon Valley. After working for Apple, Nokia, and Amazon for the past 10 years, he's become an expert in wireless technologies and hardware development. His notable achievements include helping design the Amazon Echo. He has a degree in Electrical

Engineering from UC Berkeley and studied Communications at Stanford.

JINGYI LIANG, UI DESIGNER — Jingyi has been designing for two decades, serving UI designer roles in various companies and startups in the USA and China, including Perfect World, a famous MMORPG. She has a Masters of Fine Arts (MFA) from Virginia Polytechnic Institute and a Bachelor of Engineering in Industrial and Product Design from Beijing Institute of Fashion Technology.

JOE BROGNO, CONTENT — Joe has over 10 years of experience in art direction and design. He previously worked at Nickelodeon Animation Studios as an Art Director and Supervisor. He has a degree in Animation and CGI from Full Sail University. He's also designed over 60 games in his spare time.

CHRISTINA GUO, MARKETING — Christina has two Master's degrees in Marketing and Advertising from John Hopkins University Carey Business School and Boston University. She also founded a startup previously where she developed interdisciplinary research, business development, and strategic planning skills.

APPENDIX

Works Referenced

While some of the listed works below may not be referenced or cited herein, the works contributed significantly to the ideas and conclusions drawn in the writing of this whitepaper. Works in the “Network Effects” section around modern studies of network effects and two-sided markets influenced PLAY’s network design and economics. Works in the “Blockchain” section around the latest ideas in crypto-economics and mechanism design informed the design of the incentive mechanisms relative to token networks. Cited whitepapers in the “Whitepapers” section that apply the understandings of crypto-economics in a live environment were also highly influential in creating a reference framework for the overall design of PLAY’s technical and incentive system.

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