



BRS Ecosystem Whitepaper

Blockchain-based Ecosystem for
Culture and Arts

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* The BRS Project does not engage in the sale of any tokens regardless of their form, to any Singaporean citizen or entity.

* If a local license is necessary in order to carry out a business related to the BRS Project, the business will proceed after having obtained the respective license lawfully.

I. Abstract

Although the markets for culture and arts have grown steadily year after year, they have been showing a degree of contraction since 2020 due to the rapid changes in lifestyle and surrounding environment brought about by COVID-19. However, various new services have been introduced on the basis of the online environment, which has become commonplace, and a new direction is being sought through efforts to improve on the existing services.

Introduction of a new paradigm that centers on on/offline integration has a positive aspect in that it promotes quantitative growth, but it also includes a negative aspect whereby it is said to be repeating the structural issues with the existing markets for culture and arts by ignoring qualitative improvement or, in some cases, actually exacerbating those issues.

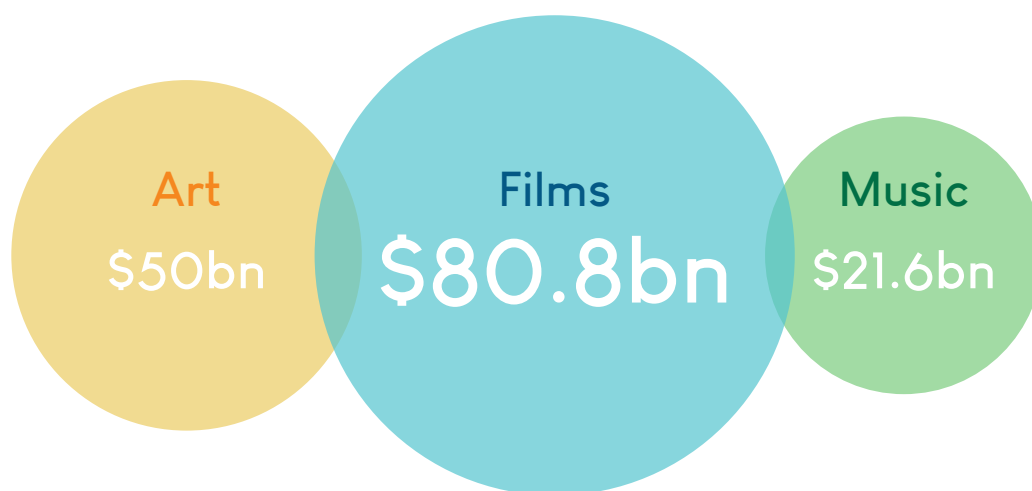
The BRS Ecosystem is not simply a pivot on services that seeks to obtain the fruits of the markets for culture and arts that have grown quantitatively. Rather, by resolving the existing structural issues and improving the general environment, it aims to promote qualitative improvement alongside quantitative growth.

By cutting down on unnecessary steps through blockchain-based distributed services, and facilitating participation of various classes of people, creative content can be supplied in a transparent and safe manner. Such an open cycle structure will be able to create a positive new current in the markets for culture and arts across the board.

II. Current Status of the Markets for Culture and Arts

The markets for culture and arts have grown steadily year after year. Although the previous growth trend has weakened somewhat since 2020 due to the impact of COVID-19, online-based markets have grown rapidly in response and new trends are emerging in cultural consumption, such as the establishment of an “untact” performance culture. In particular, as on/offline fusion has gained speed, attempts are steadily being made in relation to new forms of markets.

<Market Size in Major Culture and Arts Sectors in 2020⁰¹⁾>



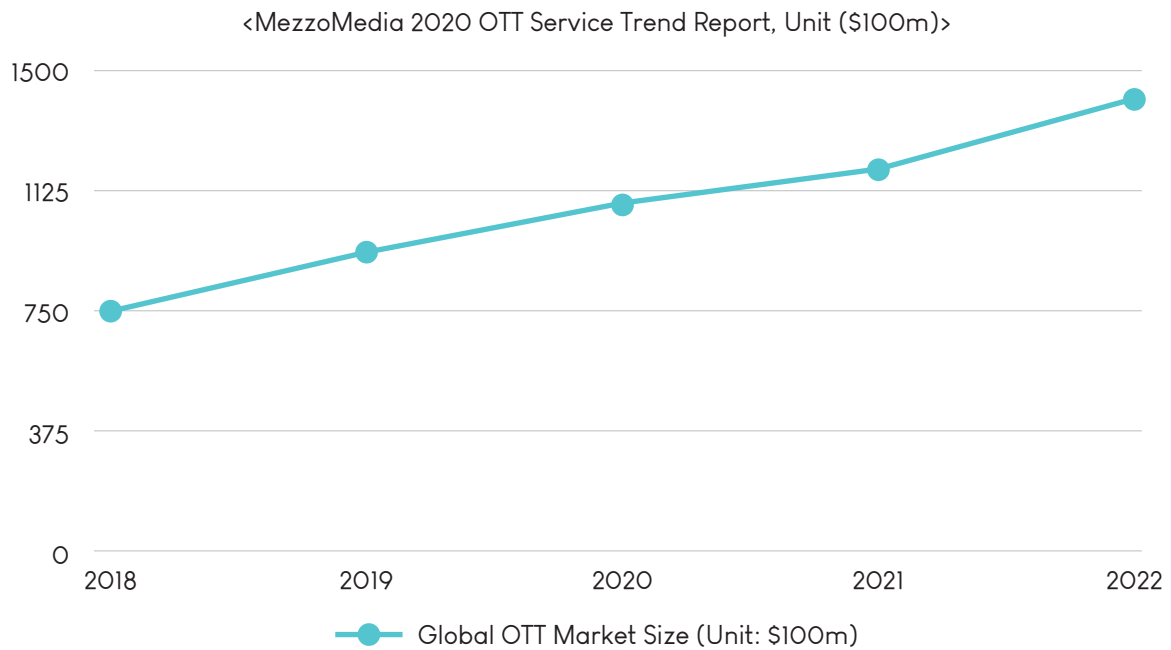
According to the data included in the <2020 Theme Report>, even though the film industry as a whole performed poorly due to the impact of COVID-19, the global theater and home entertainment markets only saw a slight decline of 18% relative to 2019, reaching approximately \$80.8 billion.

The art market is almost as big. <The Art Basel and UBS Global Art Market Report> announced that the size of the global art market in 2020 was approximately \$50 billion. Even though the impact of social distancing placed many constraints on the art industry in relation to art-related events, such as exhibitions and auctions, it still forms a large market.

As for the music market, according to the <IFPI Global Music Report 2021>, the market recorded approximately \$21.6 billion in 2020, having grown by 7.4% from the previous year. Above all, this figure is based on six consecutive years of continued growth since 2014. In contrast to the film and art industries which faltered from the blow dealt by COVID-19, the music market was able to achieve steady performance as streaming services led the market.

01) 2020 Theme Report, <https://www.motionpictures.org/wp-content/uploads/2021/03/MPA-2020-THEME-Report.pdf>
The Art Basel and UBS Global Art Market Report, <https://www.artbasel.com/about/initiatives/the-art-market>
IFPI Global Music Report 2021, <https://www.ifpi.org/ifpi-issues-annual-global-music-report-2021/>

<Increase in Size of Global OTT Market⁰²⁾>



In the case of the film industry, though the market related to new film releases continued to experience a slump, conversely, users of OTT services have grown in number, hinting at a new possibility.

As can be seen in MezzoMedia's <2020 OTT Service Trend Report>, the global OTT market, which stood at approximately \$76 billion in 2018, maintained a high growth trend of an average of 17% per year and is predicted to reach approximately \$141 billion in 2022.

The markets for culture and arts have been dealt a blow by the major disaster that was COVID-19. Nonetheless, we can infer that the markets can revert to steady growth on the basis of countermeasures taken against the issue as well as new business models. To make this clear, we would like to examine the film, music, and art markets, which can be said to be the representative sectors in the markets for culture and arts.

In addition, through an analysis of current status, we will examine the current market structure and the issues it is littered with. In contrast to the quantitative growth achieved by the markets for culture and arts, not many of the structural issues that have been raised persistently to date have been resolved. This can be seen as supporting evidence for the argument that, if we were to improve on the issues that are deep-seated in the markets for culture and arts, which are growing from strength to strength in quantitative terms, the value to be derived from this will not be insignificant.

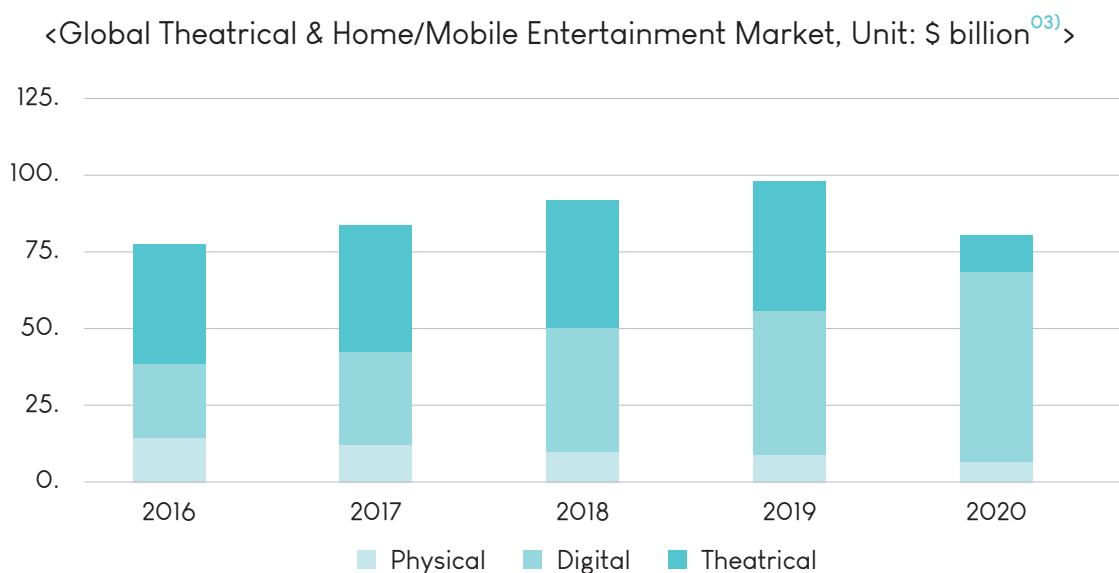
02) 2020 OTT Service Trend Report, MezzoMedia <https://www.adic.or.kr/lit/report/show.do?ukey=179127&oid=@119836%7C8%7C6>

1. Film Market

1) Current Status of the Film Market

As can be seen in the <2020 Theme Report>, due to the major disaster that was COVID-19, the theater and home entertainment markets worldwide recorded \$80.8 billion, following a 18% decline from \$98.3 billion in 2019.

Theater revenue, which was hit the hardest, declined by no less than 72%. In contrast, the home entertainment market actually grew by 31%. Even though this took place in a special set of circumstances – a pandemic, in other words – that the home entertainment market has grown to a size that surpasses theater revenue merits a closer look in that this amounted to a successful introduction of a new business model that was suited to its environment.



2) Issues with the Existing Film Industry

When one looks at the other side of the coin to the results achieved by the film industry, which put up a good defense on the basis of a new trend of online digital services centered around home entertainment, we can see that no improvement has been made on the qualitative side, and that none of the existing issues have been resolved. Nowadays in the film industry, it is often the case that, right from the start, production proceeds around large investment capital that is equipped with both investment and distribution power. Because of this, injection of capital converges on the small number of projects that prioritize box office success, with the result that it is seriously damaging diversity within the film industry. A typical example of this is a vertically integrated structure that encompasses phases ranging from investment and distribution to screening, with a conglomerate positioned at the center.

03) 2020 Theme Report, <https://www.motionpictures.org/wp-content/uploads/2021/03/MPA-2020-THEME-Report.pdf>

Structures such as this ultimately render the film industry's ecosystem inefficient. Internal transactions that seek monopoly over profits and countless unreasonable integrations lead to an increase in inefficiency in the film industry as a whole. They threaten the very survival of small production companies that have been pushed aside in the power game and undermine diversity by raising the barriers to market entry higher and higher. For these reasons, the current film world is heading in the direction where there is no diversity. In fact, in many cases, many people involved in films are unable to perform to the best of their creative abilities.

In particular, market dominance of the top four distribution companies growing stronger with time, and due to some of the conglomerates that cover both distribution and screening, we cannot but be worried about oligopoly in the film market and the resulting harm. As conglomerates implement vertical integration of all processes in the film industry, ranging from planning, production, investment, distribution, and screening of films to secondary publication rights, issues not only of monopoly and oligopoly, but also of unfair trade practices, are being raised persistently. Certain films that have benefited from injection of large capital are monopolizing the screens, resulting in infringement of the audience's right to choose and, in turn, making distribution of small and medium-scale films increasingly difficult. Such an issue of polarization has been raised persistently in the film market, but no particular improvements have been made.

Due to structural issues, entry barriers for investment and production are getting higher and higher, and we are facing a situation where inefficient conduct is becoming an issue. Examples of such conduct include instances where price is determined by the few with superior status in the market, and contractual relationships that are being entered into from unequal positions.

Issues that are often talked about in the film market are as follows:

- Climate that is orientated towards large investors
- Production process lacks transparency
- Decision-making centered around investors and distribution companies
- Due exercise of rights by staff is made difficult by the opaque settlement process
- Distorted consumption data
- Limited lineup

These issues are not being resolved by the introduction of new trends or business models. To give a representative example, film consumption through OTT is rapidly on the rise, and the film content being produced through OTT platforms is continuing to grow in scale. However, what has happened is that the party screening the films has just shifted from movie theaters to major OTT service companies; given that the existing issues of structures involving large capital and lack of transparency in the production process are still there, it is difficult to say that the existing limits have been overcome.

Crowd funding has also been suggested as an alternative for the film industry, but this is

leading to other issues due to matters such as limitations in policy, being divorced from reality, and opaque processes. Wadiz, a representative crowd funding service in Korea, presents film projects online and collects investment from the anonymous crowd by setting a target amount and funding period, but due to limitations in policy⁰⁴⁾ whereby that limit on the amount cannot exceed KRW 1.5 billion, the reality is that it can only handle fundraising that falls far short of the average production costs of actual commercial films.

While crowd funding lowers the threshold for investment in films so that anyone can easily make an investment, it also suffers from issues of extremely weak protection mechanisms for investors and inability to ensure transparency in the processes.

2. Music Market

1) Current Status of the Music Market

The size of the global music record market in 2020 was approximately \$21.6 billion. Unlike the film industry, which suffered a blow from poor performance of the industry for new film releases, or the art market, which experienced difficulties hosting exhibitions and auctions, the music market is enjoying steady and continued growth, as the online streaming market has experienced rapid growth due to the special set of circumstances created by COVID-19.

The music record market was able to take on a different appearance from the film industry because, compared to the latter, the transition from an offline-orientated market to online market took place early on.

2) Issues with the Existing Music Industry

Despite consistent high growth, the music industry has also been unable to solve its issues, which are similar to those in the film industry.

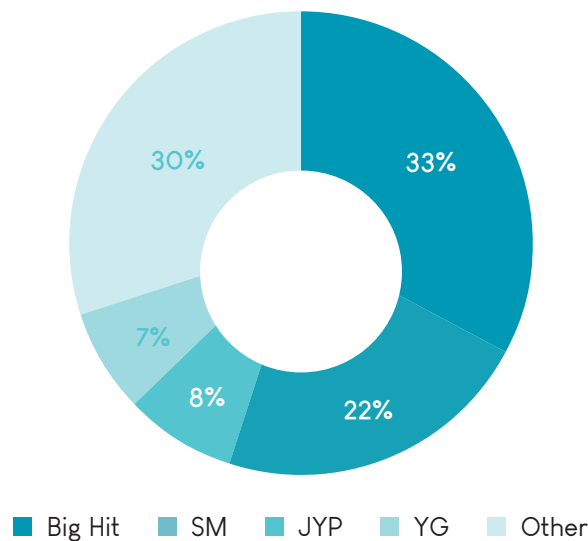
With a relatively early transition to an era of digital music, the music industry has also encountered many issues relatively early, including copyright, distribution structure, intermediary fees, and illegal downloads. However, it is hard to say at this point that these issues have plainly been resolved. Though matters have improved compared to the early stages of transition to an online environment, the issue of intermediary fees still remains, and opaque distribution and complex copyright structures have yet to be resolved. As with the film industry, the industrial structure centers around large agencies and we are facing a situation where, due to the monopolistic shares held by some of the large agencies, artists possessing an element of diversity are increasingly losing their foothold.

04) In Korea, this is predicted to be raised to KRW 3 billion through amendments to the Enforcement Decree of the Capital Markets Act and the Financial Investment Business Rules.

As time goes by, the music-consuming public's taste is becoming more and more diverse. In contrast, the base for the emergence and continued activity of artists of various genres is actually diminishing. As with the film industry, the polarization of creators is becoming more extreme.

K-pop, which is trending worldwide, also has a deformed structure where the top four major agencies account for 70% of the entire music record market, and such an oligopolistic structure is actually solidifying with time

<Gaon Chart, Yuanta Securities Research Center, K-pop Companies' Market Share of Korean Music Record Market, as of 2020>



3. Art Market

1) Current Status of the Art Market

Based on the <2020 Art Market Report>, the size of the global art market in 2019 was approximately \$64.1 billion. Though we call it the global market, it has the characteristic of severe imbalance among countries. The top three countries in the global art market are the United States, the United Kingdom, and China, and the market is so skewed that, as of 2019, these three countries held approximately 82% of the entire art market.

Unlike films or music, the art market is close to a one-man production system in which the artist plans, produces, and sells the artwork. In reality, however, various forms of intermediaries, including galleries, auction companies, and art fairs, exist in the distribution, sale, and purchase of artwork, and the majority cases proceed as consignment to these intermediaries.

2) Issues with the Existing Art Market

In 2019, Sotheby's, an auction company that had been listed on the New York Stock Exchange, went private. This can be seen as a representative example which shows that aggravation of opacity in the art market could gain speed in the future. The few definite windows for disclosure of information that go through institutional channels, are gradually disappearing.

Structure that lacks transparency has previously been criticized as a chronic issue in the art industry. Many consumers who use galleries or auctions, etc. often want, or demand, closed-door or private transactions, and in many cases, transactions do actually proceed informally.

The art market can broadly be divided into the market for public transactions and the market for private transactions. If going through the market for public transactions that is often called an auction, information such as the method for setting the price and the price at which artwork is sold is made public. This is reliable information that is disclosed through a public channel. Where transactions are made public in such a transparent manner, consumers can participate in the market on the basis of the disclosed price.

The problem is that, where transactions take place privately through galleries, etc. or directly with the artist, the process and outcome in these cases are often not made public. Unlike the market for public transactions, we do not know whether prices that have been developed in the market for private transactions were set through a reasonable and fair process, nor is it possible to find out the price that was actually paid. For this reason, such prices cannot inspire confidence in participants other than the parties themselves. Other participants must put up with all of the risks that could arise as a result of information inequality.

In addition to the issue of lack of transparency, the art market is not free from the risk of forgery either. There was a case where, after the artist Jung-seob Lee's works were sold at an auction by his second son at high prices, all of the works sold at the auction were later revealed to be forgeries. Controversies about forgeries have continued to be a frequent occurrence in recent years and, in this respect, we cannot but mention the Artwork Distribution Act. The Act aims to prevent a small number of galleries from having a monopoly or oligopoly on the art market.⁰⁵⁾

Even when domestic examples are considered, a very small number of large galleries have adopted a structure where they are going beyond galleries' own territory and wielding influence in auctions and appraisals, and those galleries have formed an oligopolistic market in which they are gaining market shares through such a structure. In many cases, the survival of galleries that are smaller in size is under threat because of this. The result is that diversity is undermined; as well as infringing on the rights and interests of consumers, it creates a structure in which creative artists struggle to receive fair appraisal, thus continuing the vicious cycle.

05) As of 2017, a very small number of galleries accounted for 80% of total sales in the gallery market.

In other words, the art market has yet to provide an answer to the following issues:

- Closed nature of the market
- Unreasonable price-setting
- Artist imbalance
- Lack of transparency in appraisals

When market size is considered in isolation, the art market is also gradually growing in size. However, it is still the case that a small number of galleries wield influence over the entire art market, with the result that creative artists, and small galleries that wish to identify those artists and let them enter the market, are in an extremely precarious position.

A monopolistic or oligopolistic market can go beyond issues of creation and distribution of art and have a negative effect on the consumption market as well. Not only is it the case that the breadth of taste and choice becomes narrower as consumers are only able to consume limited artwork, but it is also more likely that they would suffer harm due to lack of transparency in appraised prices and distribution structure.

4. Common Issues

Through an analysis of the current status of the film, music, and art markets as the representative domains for culture and arts, and a scrutiny of issues with those markets, we can see that there are common issues, namely that, irrespective of the sector, standardized and large capital-orientated creations form the mainstream, and that markets lack transparency in their structure.

These issues have been repeating themselves without being solved structurally within the existing ecosystem and, in some cases, have actually become more severe. Now, as reorganization takes place across the board in production and consumption in the cultural and artistic industries as a result of COVID-19, if we were to improve on the issues through a new ecosystem, we will be able to create a virtuous cycle in which superior and more diverse content is produced and consumed in a transparent manner.

III. Theoretical Background to Improvement on the Issues

1. Blockchain

Bitcoin, which was proposed by Satoshi Nakamoto in 2008, proved that value can be stored and transferred even in the absence of a trusted third party.

The existing and traditional means of making online remittances involved a structure whereby ownership was confirmed and verified remotely through the Digital Signature Algorithm (DSA). As this required intermediation by a trusted third party to prevent double-spending⁰⁶⁾, it is possible that issues may arise, such as a fall in efficiency resulting from a rise in costs, or lack of transparency resulting from concentration of power. In contrast, through cryptography, Bitcoin effected direct trading between parties that does not go through an intermediary.

Bitcoin's electronic currency system involves connection of digital signatures⁰⁷⁾, as shown in Figure 1. Owners form transactions by digitally signing a hash of the previous transaction and the public key of the next owner, connecting the signatures, and sending them.

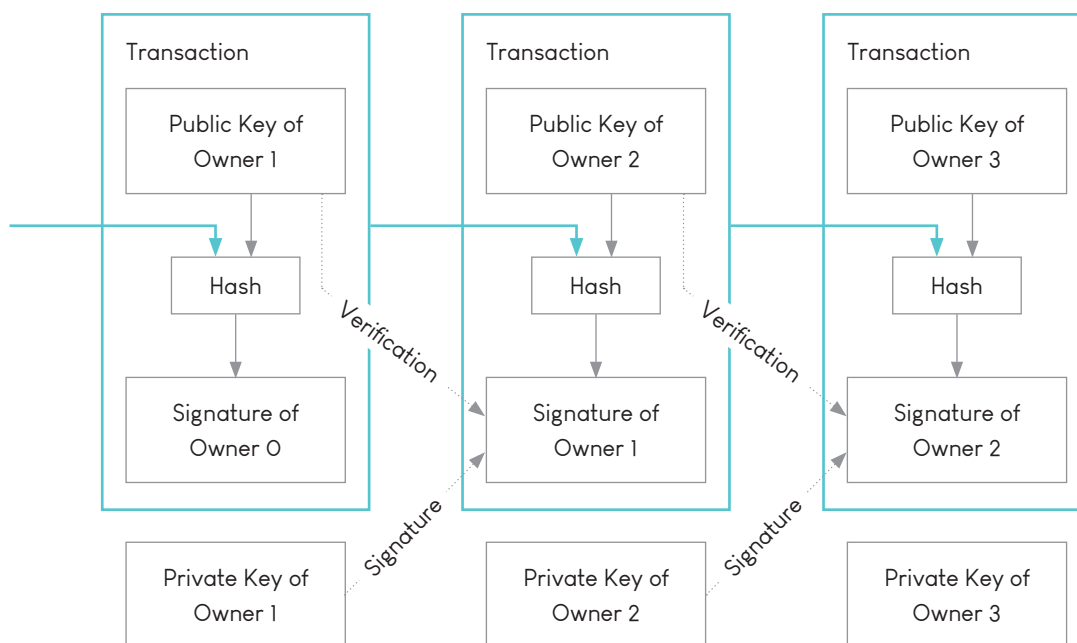
The recipient can verify the authenticity of the signatures through a process whereby ownership is confirmed cryptographically. From the recipient's position, if all of the original owner's transactions are in a state where they can be confirmed through an open network, they can avoid the possibility of double-spending even when this is not guaranteed by an intermediary. This becomes the key factor that requires Bitcoin to preserve its decentralized nature.

In addition, as shown in Figure 2, Bitcoin transactions are recorded on the blockchain in chronological order and are connected in such a way that the next block strengthens the stability of the previous block. Bitcoin has the characteristic where, as this process is repeated and the chain grows longer, the stability of the blocks increases incrementally.

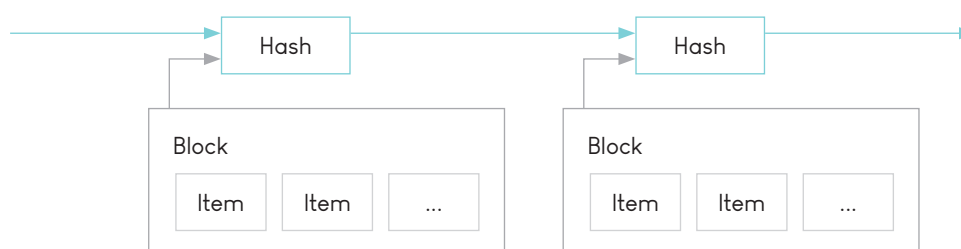
06) In the Bitcoin system, balances are checked on the basis of UTXO (Unspent Transaction Output). Using the same UTXO elsewhere in a duplicative manner amounts to double-spending.

07) Bitcoin uses ECDSA (Elliptic Curve Digital Signature Algorithm).

<Figure 1. Bitcoin's Signature Structure>



<Figure 2. How Bitcoin Connects Blocks>



In order to realize this on the basis of P2P, Bitcoin uses Proof-of-Work, which is similar to Hashcash⁰⁸⁾ proposed by Adam Back.

Proof-of-Work used in Bitcoin forces calculations to be made repeatedly by changing nonce, an arbitrary value, until the outcome of running the hash function produces satisfactory 0 bit. If the outcome of repeated calculations meets the given requirements, a block is created, and this block may not be changed unless it is able to carry out work that is more difficult than the work previously carried out to create the block. This is because, unless this is satisfied, the nodes maintaining the network would not accept it as a valid connection of a block.

This structure can be maintained through an incentive system, even when there is no intervention or intermediation by a third party. If a miner creates a block through Proof-of-Work, the miner who created the block is given newly created Bitcoins, along with fees for individual transactions included in the block, as a reward for maintaining the network. Through reward coins, which act as an inducement, a state is maintained where profits to be gained by cooperating with the network are greater than the profits that would be gained by attacking⁰⁹⁾

08) A. Back. Hashcash: A Denial of Service Counter-measure. <http://www.hashcash.org/papers/hashcash.pdf>, 2002.

09) An attack means the act of creating a wrong block.

the network. Such an environment acts as a mechanism that motivates miners to perform a positive function for the blockchain network.

Bitcoin realized a value transfer system that is free from double-spending, without any third party intervention. The blockchain technology that has been used for these purposes can go beyond a simple value transfer function and can be applied to resolve the negative effects of centralization. In fact, the blockchain technology is currently being used as the underlying technology for various decentralization projects and is expanding its territory.

The main advantages that can be gained by applying the blockchain technology are as follows:

- Decentralization
- Transparency
- Irreversibility

Blockchain does not require a trusted third party. It can be designed so that all members play a positive role for the network in line with their interests. In addition, all data can be checked in a transparent manner and, through the characteristic of irreversibility, stability can be ensured. These advantages also have significant implications for the design of the BRS Ecosystem

2. Proof-of-Authority

Proof-of-Work algorithm used in Bitcoin excels in terms of stability but has limited scalability. Various methods have been suggested as alternatives to solve the issue of scalability, and Proof-of-Authority (hereinafter, "PoA") is one of several such alternatives.

PoA is an algorithm that proves authority through reputation, instead of forcing work to be carried out or requiring stakes in order to reach consensus. For this reason, PoA needs a specific actor who can prove their trustworthiness and authority.

Due to this characteristic, it is difficult to regard PoA-based blockchain as guaranteeing complete decentralization. In order to remedy this, in some cases, rather than introducing PoA directly in the consensus algorithm used to create blocks, PoA is used in the side chain with Proof-of-Work or Proof-of-Stake being used for the blocks.

3. Smart Contract

In 2015, Vitalik Buterin proposed a distributed computing platform¹⁰⁾ called Ethereum, which implemented smart contracts in the P2P-based blockchain.

10) Ethereum operates in a manner that is Turing-complete.

Bitcoin uses simple scripts. In contrast, by introducing Ethereum Virtual Machine (EVM) in the blockchain, Ethereum can implement a usable program in decentralized form.

Through code-based smart contracts¹¹⁾, Ethereum can implement decentralized applications (DApp) that perform various roles and, through these, acts as a platform that can develop and run various DApps.

DApps operating on the Ethereum platform at the beginning were closed and independent, whereas now, in 2021, they are advancing to the stage where they can increase synergy by connecting with other smart contracts. To give a representative example, protocols like Chainlink, which support decentralized oracles, are presenting a new direction from the aspect of connection between DApps. Through connections between DApps, synergies between DApps can be maximized on the more open Ethereum platform.

Through smart contracts, Ethereum allowed contracts that are predictable and irreversible, and are accompanied by an element of force, to be processed in a transparent manner. This is meaningful in that it not only reduces errors that arise in the implementation of the project as a whole, but it can also be economical in its operation by omitting the intermediary.

4. DAO

DAO (Decentralized Autonomous Organization) refers to an organization which, unlike existing centralized organizations, is run through consensus that is based on decentralization. It has evolved incrementally from the concept of Decentralized Organized Corporation¹²⁾ presented by Daniel Larimer in 2013 and, though the degree of intervention varies slightly, they are not very different in that they both aim to operate on an open source software that is verifiable at a basic level, without any intervention by a trusted third party.

Maker, which operates stable tokens through collateral-based smart contracts, is a typical DAO¹³⁾ project. The Maker Protocol operates a token called Dai, which is pegged to the US dollar, through distributed governance and is actively used in a wide range of areas.¹⁴⁾ The success of Maker DAO can be seen as proof that governance in the sensitive area of finance can also be run in a sufficiently stable manner through DAO.

KyberDAO, a liquidity protocol, also operates a token swap service through transparent on-chain governance and can be regarded as a successful example of a protocol that has been designed to motivate members of the DAO in a positive direction.

11) This was first suggested in 1996 by Nick Szabo but was not realized in practice.

12) DAC Revisited, Daniel Larimer, <https://letstalkbitcoin.com/dac-revisited>

13) Maker DAO Whitepaper, <https://makerdao.com/en/whitepaper/>

14) As of now in May 2021, approximately \$4 billion worth of Dai, the Maker-based token pegged to the US dollar, is in circulation.

Thus, it can be amply proved through numerous examples, including Maker DAO and Kyber DAO, that, if a DAO is designed so that the grant of pecuniary benefits among its members is stable, it can be used as a tool that applies multiple members' views to the ecosystem in a transparent manner. However, sufficient verification work is needed so that issues with the protocol's design do not give rise to any governance errors or malicious members. To this end, sufficient time and effort needs to be expended in the design, including checks on stability and simulation of various attack cases.

5. NFT

Non-fungible token (NFT) is an opposing concept to fungible token (FT), and was developed to realize unique information, value, or characteristic on the blockchain.

Ethereum systematized FTs by presenting ERC-20¹⁵⁾, which is the standard for tokens that are based on smart contracts, and, by adopting this, various projects implemented blockchain-based services. However, ERC-20's functionality is not sufficient to indicate information or value that has a unique characteristic, or its corresponding ownership. ERC-721¹⁶⁾ – the standard for NFTs – is mainly used as an alternative that realizes the unique characteristic on-chain on Ethereum.

NFTs can confer a unique characteristic on each individual token. Therefore, unlike FTs, they can possess rarity and also inherit the basic characteristics of the Ethereum blockchain, namely the advantages of decentralization, transparency, and irreversibility.

NFTs became widely known to the public through CryptoKitties¹⁷⁾, an Ethereum-based collection and breeding game. In CryptoKitties, all cats are brought to life with different appearances, and, through these, they take on a unique value; depending on their rarity, the cats are traded on the market at differing values. From CryptoKitties' NFTs, we can see that the principle of rarity in real economy can be amply traded on the blockchain.

Decentraland¹⁸⁾, which created 3D virtual world, offers an example where LAND – a unit of land – was realized through ERC-721 and used as title to land in the virtual world. By realizing the concept of title through the blockchain, intermediate stages were omitted, and stable management of title was made possible without the need for complex title verification procedures.

15) ERC-20 Token Standard, <https://ethereum.org/en/developers/docs/standards/tokens/erc-20/>

16) Although ERC-721 is the representative Ethereum-based standard protocol for NFTs, there is also the ERC-1155 standard, which enables transactions that combine ERC-20 and ERC-721. ERC-1155 was developed in 2018 by Witek Radomski, and since it allows batch transfers and supports atomic swaps, transactions can be carried out in an efficient manner.
ERC-721 Non-fungible Token Standard, <https://ethereum.org/en/developers/docs/standards/tokens/erc-721/>

17) <https://www.cryptokitties.co>

18) <https://decentraland.org>

Now, in 2021, as interest in NFTs is rapidly on the rise in the mainstream, NFTs are being applied in various areas. Grimes, Elon Musk’s wife and a singer, realized her digital art as NFTs and put them up for auction, generating sales of approximately KRW 6.5 billion. In the case of NBA Top Shot¹⁹⁾, which allows people to collect cards of NBA stars, the service has grown so much in size that the maximum daily transaction volume reached approximately KRW 60 billion.

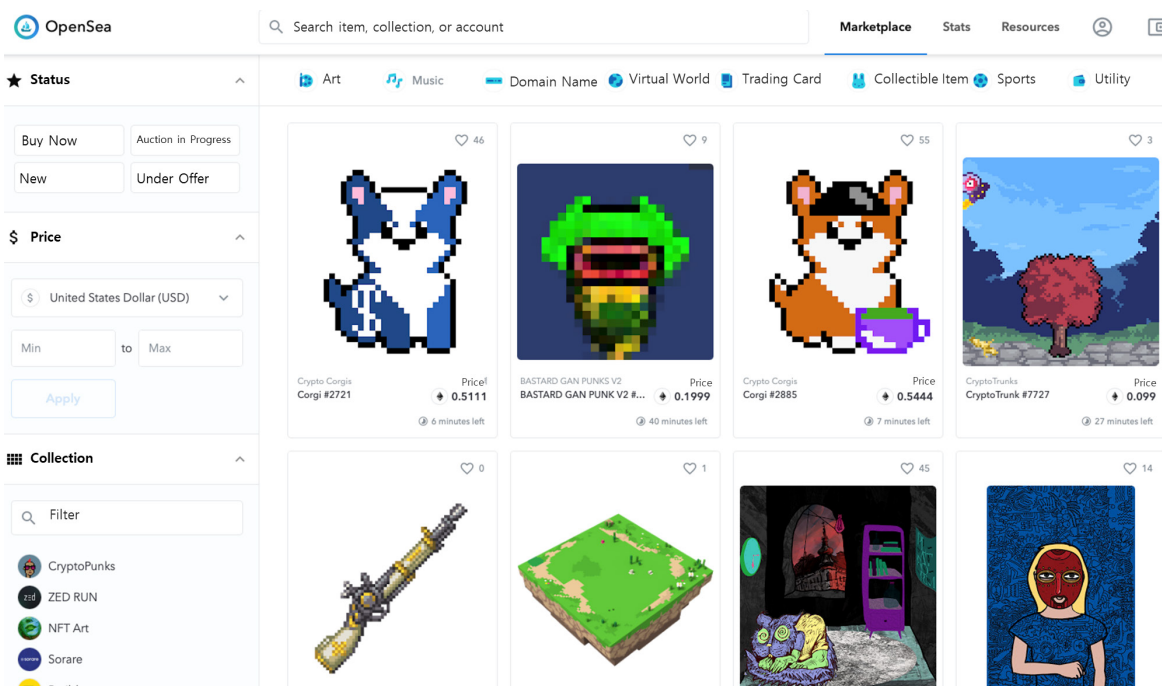
6. Meaning of Scrutiny

Through the existing examples, it can be seen that, by constituting the existing unique value, information, and title in decentralized form using NFTs, the intermediate stage can be omitted, and that such value, information, and title can be maintained both transparently and safely through the underlying blockchain.

However, as the NFT market is still in its early stages, the side effects cannot be ignored. It is more often the case that, rather than applying broad areas and diverse ideas, storage of one-dimensional value or abnormal rarity is relied upon, and in many cases the product that has been realized is inferior in quality.

In fact, even in OpenSea²⁰⁾, a representative NFT marketplace, most of the NFTs on the marketplace are those that do not meet the standards in terms of their quality, and some thought needs to be given to any harm that this may cause

<OpenSea’s Actual Service Page in May 2021>



19) <https://nbatopshot.com>

20) <https://opensea.io>

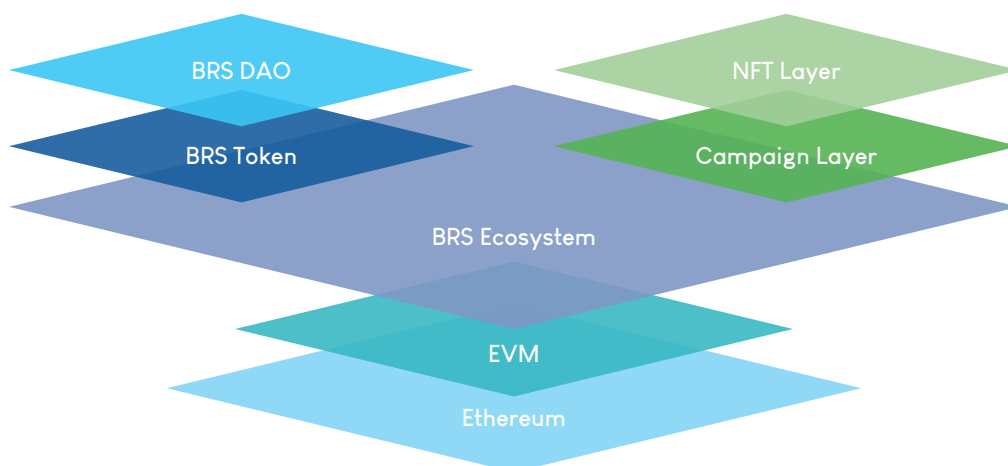
IV. BRS Ecosystem

In order to present a new paradigm for the rapidly changing culture and arts ecosystem, we have devised the BRS Ecosystem. Based on the structure of the existing markets for culture and arts analyzed earlier, we resolved the issues that currently exist through the solutions considered in III. to arrive at a transparent and stable blockchain platform.

1. Composition of BRS Ecosystem

The BRS Ecosystem is broadly composed of the BRS Token, which is responsible for storage and transfer of value, and governance; the BRS DAO as the distributed organization that is in charge of the Ecosystem's governance; the Campaign Layer, which is responsible for initiation, production, and completion of content; and the NFT Layer, which mints, maintains, and manages NFTs.

<Figure 3. Structure of BRS Ecosystem's Strata>



2. BRS Token

In the BRS Ecosystem, BRS Tokens are responsible for the value storage and transfer functions, and the guarantee of rights for the purposes of governance by the BRS DAO. They are distributed in the form of smart contracts that are used on the EVM. BRS supports all ERC-20 standard functions, and also includes a governance function for the BRS DAO.

1) Issue Volume

1,000,000,000 BRS Tokens are minted in total.

2) Value Storage and Transfer Functions

BRS Tokens store value within the BRS Ecosystem and can be exchanged for other assets (e.g. NFTs in the NFT Layer or other ERC-20 tokens) and can be transferred through the Ethereum network.

3) Governance Rights for BRS DAO

The BRS DAO can be used to take part in decision-making within the BRS Ecosystem, or to autonomously change the various parameters for operation. To do this, BRS Tokens must be staked, and, as a reward for staking the tokens, BRS accumulated in the BRS DAO Pool²¹⁾ is paid at a fixed rate.²²⁾

Conversely, if one fails to take part in governance normally, or gives wrong approval, BRS that has been staked may be slashed. This will be covered in more detail in BRS DAO.

3. BRS DAO

The BRS DAO is constituted in an improved form in order to eliminate the inefficiencies that have arisen due to the existing DAOs' pursuit for complete decentralization. As the distributed council intended to operate and carry out decision-making for the BRS Ecosystem, one qualifies for membership by staking BRS Tokens with the DAO and acquires voting rights in proportion to the number of BRS deposited

The main roles of the BRS DAO are as follows:

- Examination of campaign registrations
- Inspection of any misconduct that takes place during the campaign
- Inspection of records on management of funds
- Adjustment of parameters for the operation of the BRS Ecosystem (e.g. half-life variable for campaign bounty, slashing rate variable for BRS DAO, etc.)

Based on the premise that the above roles are performed diligently, the BRS DAO receives BRS accumulated in the DAO pool at a fixed rate. Conversely, on a failure to diligently play its part, BRS that has been staked is slashed at a fixed rate.

The main conditions that will result in slashing are as follows:²³⁾

- If non-participation accumulates during a prescribed voting period
- If misconduct is discovered in the inspection of fund management records

As the BRS Ecosystem expands, the DAO's powers will also increase in a proportionate manner. Members of the DAO are those who have deposited their BRS on the network through staking. Since BRS that has been deposited is akin to collateral in its effect, members will be motivated to act in a way that promotes the advancement of the BRS Ecosystem, rather than

21) The BRS DAO Pool accumulates BRS at a fixed rate at the campaign recruitment stage in line with the rate agreed by the DAO.

22) This rate is decided by the BRS DAO through consensus.

23) These may be changed for the better on the basis of operational data from BRS Ecosystem Beta.

in a manner that is detrimental to it. Nonetheless, in order to avoid giving rise to unreasonable governance, stability of the ecosystem needs to be maintained by designing and running the BRS DAO Pool soundly.

The BRS DAO can be seen as a DAO that has the character of PoA, rather than one that is completely decentralized. The core members of the DAO only obtain power if they prove their reputations, which must be verified by the DAO..

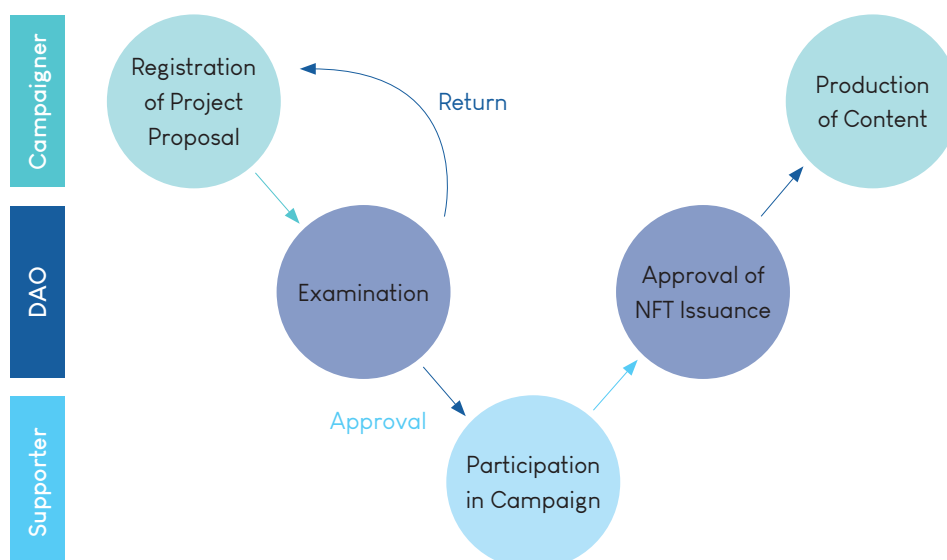
BarunsonLabs²⁴⁾ collects and uses the DAO participant’s opinions to base its policies. In the beginning, BarunsonLabs is the DAO participant with the most BRS Tokens deposited and the most active operator that produces and distributes cultural content. However, with the expansion of the ecosystem, we expect this ratio to change as the number of new cultural content participants and business partners will increase.²⁵⁾

4. Campaign Layer

The BRS Ecosystem can handle NFTs for finished content that have not been through the production phase, but it also offers functionality where it handles phases ranging from proposal of content and production to completion. Where the processes ranging from proposal of content to completion are processed through the BRS Ecosystem, each cycle that takes place until a single content (or a set of contents) is completed is called a campaign.

The following shows the schematics of how campaigns progress:

<Figure 4. Progress of Campaigns>



24) <https://barunsonlabs.io>

25) BarunsonLabs influences liquidity by supplying rewards through BASS (BRS Airdrop Supply System, Featuring in Planning Stage), and the liquidity supply to the market will increase gradually as the ecosystem develops through this process.

1) Campaign Founder and Campaigner

Campaign founder means persons who produce content through the BRS Ecosystem. In order to successfully open a campaign that they wish to pursue through the BRS Ecosystem, they must present persuasive grounds in the form of verifiable online material and are obliged, even in the middle of the production process, to disclose material concerning the intermediate process by agreement. If this is not fulfilled faithfully, they are sanctioned by the BRS DAO.

2) BRS DAO

After approving the opening of a campaign, by verifying and overseeing the entire process the BRS DAO plays the important role of enabling the content to be produced successfully. All members of the BRS DAO are actual participants in the BRS Ecosystem who have staked BRS, and wrong decisions would result in the loss of BRS they hold. Anyone can take part in the BRS DAO so long as they are BRS holders. This plays an important role in reflecting diverse views in the campaign, rather than the biased intentions of a particular group that wields influence.

Based on the governance of DAO, BarunsonLabs plays a role in determining the direction of the BRS Ecosystem and reflecting them in the operation of BRS.

3) NFT Purchaser and Supporter

Persons who have purchased NFTs through the BRS Ecosystem's campaigns become owners of the NFTs in question and are at the same time supporters of the campaign.

They may take part in any decision-making that takes place during the production process as the campaign progresses, and may interact with the campaigner in various forms (e.g. exposure on a film's ending credits, etc.).

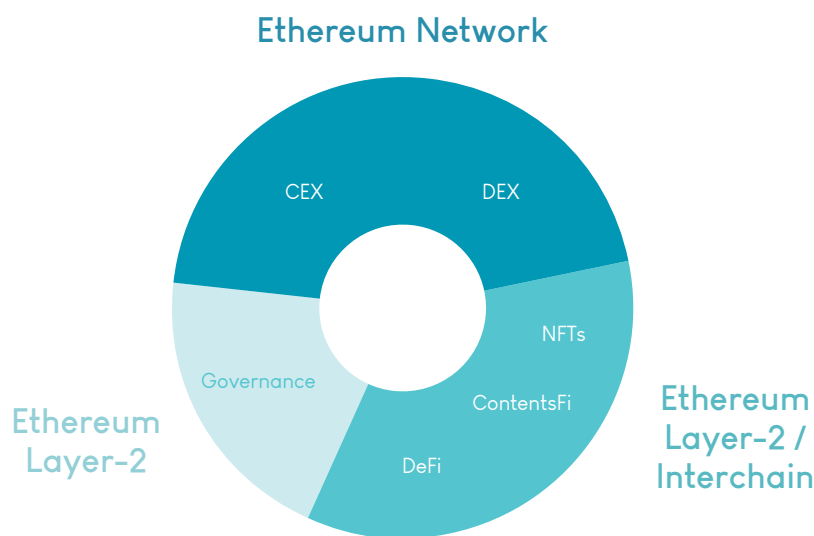
In other words, supporters hold NFTs for various purposes, including simple fandom, value investing purposes, and active participation in production, but they are also a group that has a common goal, in that they ultimately hope that the campaign will succeed. This forms the foundation that gets the BRS DAO, campaigners, and supporters to act in good faith towards the BRS Ecosystem, despite the fact that they each have different goals.

5. NFT Layer

Within the BRS Ecosystem, the NFT Layer performs the functions of minting, maintaining, operating, and if necessary, burning, NFTs.

NFTs that have been created through the NFT Layer of the BRS Ecosystem comply with the ERC-1155²⁶⁾ or ERC-721 standard.

6. BRS Tokenomics



BRS Tokens utilize networks that are convenient for each sector. For example, wrapped BRS is used for DeFi, NFTFi, GameFi(P2E), etc. Similarly, the polygon network, an Ethereum Layer 2 Solution, has excellent compatibility with Ethereum and therefore is used for governance through a polygon-mapped pBRS.

The primary function of governance through pBRS is to control the liquidity of BRS.

Participants of the PoA based governance participate in governance by converting their BRS to pBRS through the polygon bridge.

General users may stake (Delegating) by selecting a governance participant.

Any incentive paid to a participant of pBRS governance (Staking and Delegating) will be

paid from a separate governance pool. The governance pool is made up of various fees (NFT issuance, transactions, profit conversions, etc.) and slashing penalties. In addition, an interest is paid by multiplying the automatic conversion fee rate (r) with the interest rate multiplier

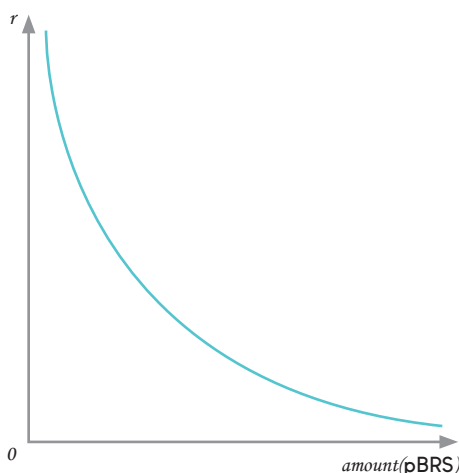
26) When classified according to the token's technical character, it is difficult to view ERC-1155 as a complete NFT. The meaning of NFT for the purposes of the BRS Ecosystem includes ERC-1155's divisible token.

(m)²⁷⁾ regulated by governance.

$$\text{Incentive Interest} = r \times m$$

The automatic conversion fee rate (r) is adjusted according to the total number of BRS minted and the number of pBRS transferred to the polygon network.

<The Correlation between the Quantity of pBRS and the Automatic Conversion Fee Rate>



If excessive conversion of BRS to pBRS leads to the poor liquidity of BRS in the Ethereum network, the interest rate shall be decreased to induce the withdrawal of pBRS. On the other hand, if participation in pBRS is low, the interest rate shall be increased to induce participation in pBRS.

The interest rate multiplier (m), which regulates the interest rate through governance, shall be operated separately in case the effect is too extreme at the offset of the service, or the governance pool fails to maintain an appropriate level.

An increase in BRS-related content leads to an increase in BRS-related transactions, which leads to the expansion of the governance pool. The correlation between the actual incentives paid to governance participants (t_1), the quantity staked on the entire networks (S), the total number of pBRS in the governance pool (G), the quantity of staking that have been participated (s_1), automatic conversion fee rate (r), and the interest rate multiplier (m) are as follows:

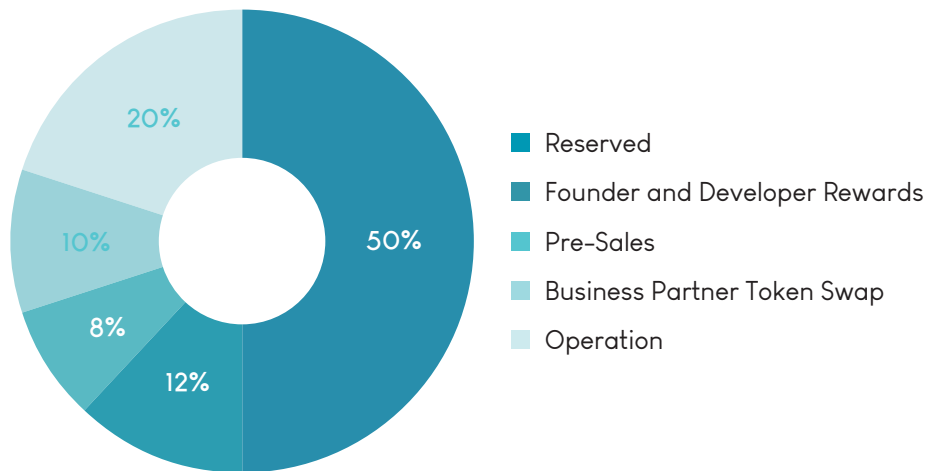
$$t_1 = G \times \frac{s_1}{S} \times r \times m$$

27) The interest rate multiplier (m) is a parameter for exceptional situations, and the maximum value is limited to 1 in order to prevent any governance participant from inducing the exhaustion of the governance pool.

The increase in the quantity of content means an increase in the total number of pBRS in the governance pool (G), which increases the amount of interest that is actually paid to the individuals. An increase in staking revenues will lead to the conversion of BRS to pBRS. This decreases the number of distributable BRS. Simultaneously, the increase in published content also leads to an increase in the demand for DeFi. One may participate in DeFi, such as NFT, etc., through kBRS, and in order to do so, the BRS must be wrapped in kBRS, which leads to the decrease in the total amount of distributable BRS.

7. BRS Token Distribution

The BRS Tokens are allocated in accordance with the following ratio at the time of issuance. After the initial issuance of the Tokens, the following ratio will become diluted naturally as the ecosystem is invigorated and each participant partakes in the activities. Moreover, we will introduce and use the BASS system (BRS Airdrop Supply System, Feature in Planning Stage)²⁸⁾ to operate the BRS Ecosystem systematically.



1) BASS (BRS Airdrop Supply System, Feature in Planning Stage)

Users may acquire or retain BRS directly through various services that use BRS, such as NFT, Metaverse, Defi, etc. However, they may also acquire BRS as a reward for participating in the network. BASS is a system used to stably supply BRS to those who participate in the ecosystem as their reward.

The value of BRS increases as the number of cultural contents using BRS and the number of participants within the BRS ecosystem increases.²⁹⁾ As the supply of cultural content will be distributed actively at the beginning of BRS distribution, there will be a need to encourage the users to participate in order to maintain the balance. To attain the above, we have decided to use airdrop as a method and introduce BASS for systematic operation.

V. Roadmap

1. Distribution of Smart Contracts for BRS Tokens

BRS Tokens can easily be linked to other ERC-20 compatible platforms even from an early stage. In order to solve the issue of transaction fees on the Ethereum network, the Polygon network³⁰⁾, an Ethereum layer 2 solution, will be used.

28) This function is being used at the planning stage and may be changed if a better alternative is found.

29) The value may decrease if the opposite occurs.

30) <https://polygon.technology>

2. BRS Ecosystem Beta

In order to launch the BRS DAO stably on the mainnet, first, stability needs to be verified at the verification phase by assuming sufficient number of attack cases and running simulations on them. At the Beta phase, when verification is being carried out, the BRS DAO will go through a verification process on the testnet³¹⁾ and will be run on the mainnet in the form of a closed group where the DAO's role is restricted to the maximum extent possible. The Campaign Layer will also be run in minimized form where some of the functionality is restricted.

3. BRS Ecosystem

After going through verification of some of the functionality on the testnet, BRS Ecosystem Beta will implement the DAO that has been disclosed through a smart contract upgrade, and remove all functions of the Campaign Layer. While this is ongoing, BRS Tokens and NFTs that have been issued through the BRS Ecosystem will not require separate work on migration.

31) Closed beta will be run on a private testnet, and open beta will be run on Polygon's Mumbai testnet.