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KOK PLAY

WHITE PAPER

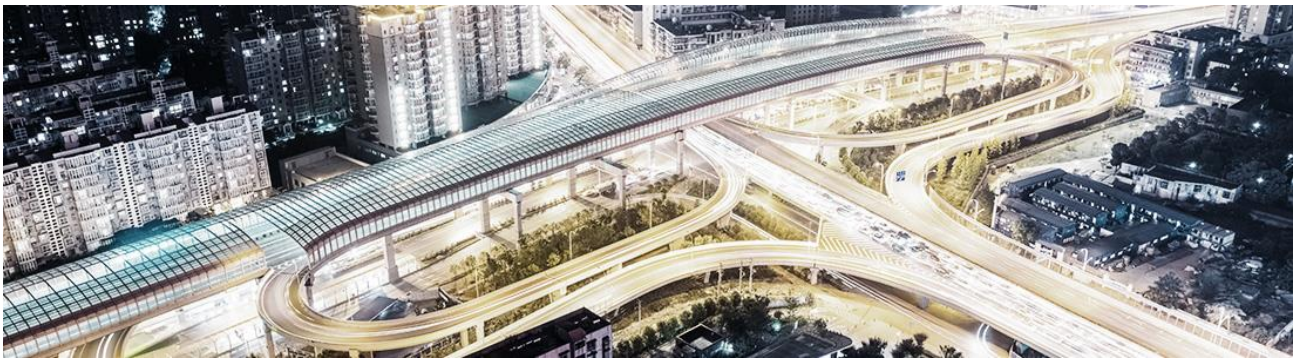


Keystone of Opportunity & Knowledge

Digital Contents Platform

"Fair & Shared Digital Contents
Ecosystem Enabled by Blockchain and AI"

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EXECUTIVE SUMMARY

The global market for cultural content is expected to reach almost an astounding USD 1 trillion as of 2022. In particular, the portion of digital content is expected to reach 52 percent in 2021, compared to only 33.5 percent in 2012, and has been grown rapidly by more than 20 percent annually.

In order to enjoy content in the past, we had to go to a theater or a concert hall, but now we can easily enjoy all of these contents from the comfort of our mobile devices.

The digital content market showed significant growth with the advent of relevant platforms such as Netflix, YouTube, and the Play Store, which enabled the active distribution of content to all over the world.

However, as globalization accelerates, the monopoly of several large platforms has deepened, resulting in greater platform influence over content providers. .

Eventually, content providers have been caught in a vicious cycle of profitability, offering huge fees to the platform while failing to seize the opportunity to properly expose their content. Moreover, as the platform has a huge influence in selecting content, the market has been distorted by the uniformity of the content according to the direction of the platform, thereby contaminating the content ecosystem.

The recently emerged blockchain technology has demonstrated the potential of building a democratic system through its core value, decentralization. Certain blockchain technologies are not governed by groups or central forces, and all transactions and events are transparently disclosed. Therefore, there is little risk of forgery or counterfeiting. KOK Foundation has developed a digital content distribution platform through blockchain, noting the potentiality and possibility of blockchain technology.

Especially, as other types of blockchain such as EOS also implemented Non-Fungible Token (NFT) technology that was introduced with a sensational spotlight on Crypto kitties, a DApp of Ethereum, scarcity and rarity are guaranteed, which enables Non-Fungible digital items with their unique value to be generated and circulated.

KOK PLAY is a decentralized digital content platform that was created through the combination of our AI, big data, and the blockchain technology, which is currently in the spotlight. To solve the problem of monopolization of the existing global platforms, it was developed to realize three values: fair, share, and enabler.' KOK PLAY is a platform that allows all creators to fairly exploit the assets of the platform(fair), share values, vision, and fair returns accordingly(share), and ensures creator’s freedom to create(enabler). KOK PLAY hopes to realize this vision into a reality with its users.



Foundation of KOK PLAY Development

1.1. Social Problems

Centralized Giant Platform Monopoly

Giant Monopoly Platforms such as Apple's App Store or Google Play impose a substantial amount of fee to contents suppliers who use the platform, by leveraging their market dominance. Moreover, are involved with every of step of content distribution so they may manipulate supply and demand of those contents in the market. This results in deterioration of profit for the content suppliers as they have to pay for the high app fee and increasing marketing expense, while providing contents that the platform wants, not users, which also leads to the deformation of the content market ecosystem. This is a typical problem stemming from centralization and monopoly, and this is why decentralized platform is necessary.

Asymmetric Compensation Model

The creation and distribution of contents requires numerous people to cooperate as each field of content creation is specialized. One example is the music service where the profit made by each song can be distributed to the writer, producer, and distributor depending on necessity. Similarly, in case of game servicing, the developer, distributor, platform, solution provider, etc., and whoever else participated in the development and distribution of the game will share the profits. The problem occurs when it is hard to measure the exact level of contribution of each participant and even if it is possible, the profit goes to those who have the strongest negotiating power than to those who have actually contributed the most. Much of these issues can be solved once we utilize fairness based on the transparent blockchain technology, and Smart Contract.

1.2. Existing Blockchain Technical Issues

The first blockchain Bitcoin was devised to enable the transferring of non-governmental currency between two traders. However, as blockchain technology gained more popularity and the philosophical value and potential of decentralization technology became more ubiquitous, the boundary of blockchain technology has expanded from mere transferring to providing new solutions that can change the structure of the traditional industry as we know it.

Accordingly, there have been numerous attempts and technological developments such as Smart Contract, DApp, DAO, NFT and etc. As these innovative concepts still remain at an experimental level, it is also true there yet remain numerous hurdles we need to overcome to achieve complete decentralization.

One of Ethereum's co-creator, Vitalik Buterin categorizes these problems into several major factors; governence, speed, waste, DApp utility and choice. That means, the problem at hand that blockchain technology has is, "How can we create blockchain that can solve these four factors into a decentralized and safe method?"



1.2.1. Network Issues

Efficiency

Vitalik Buterin: "PoW wastes billions of dollars a year, much more than the sum of all fraud and theft cases combined. It's a big tragedy."

Modern blockchain, even the most advanced blockchain projects, are suffering from the same problem. In other words, all transactions are being conducted one by one. This applies equally to proof of stake (PoS) as well as to the proof of work (PoW) blockchain. Transactions are stored one by one in blocks, and only one node is able to generate a block at one time. All of this brings the results of sequential execution of transactions and smart contracts. This turns the backend of the blockchain network into a giant supercomputer, taking away 99.99 percent computing power.

1.2.2. Governance Issues

Centralized Infrastructure

Vitalik Buterin recently said: "The Bitmain and Alliance Pool currently has 52 percent of all Bitcoin's hash power. Isn't it a big problem?" Centralized network resources poses the risk of severe damage to the entire PoW network, even with domination, penetration, or shutdown of a small number of targets.

Governance

Vitalik Buterin: "Considering how EOS governance has been catastrophic, doesn't this mean that there is a fundamental flaw in all on-chain governance, including DAO? What decentralized self-organization is able to counter bribery attacks or plutocracy?" Governance has much to learn from existing methods, frameworks and attempts. In governance, there are a few things we need to fix from the beginning. Some should be changed later after evaluating the reality. Computer scientists are looking for the perfect solution for blockchain governance that is safe and protected from countless malicious decisions and exploits. Like the U.S. Constitution, a powerful system will be the foundation for future change that needs to take place later. We constructed much of the design with this only question in mind: "What is fair governance in cryptocurrency?"

1.2.3. Software Issues

Utility

Vitalik Buterin: "Why there aren't any large applications that are useful yet?" Most blockchain applies several viable entities such as smart contract and chain codes. Use of newly invented or light programming language can reduce the reliability and expressiveness of the code. Smart contracts are short and simple. The languages and techniques used in blockchain do not allow the development of rich functions and powerful systems. Only a few smart contracts exceed 1,000 codes. However, complex business logic, rich content manipulation, and creating DApp that connects multiple users – has all been made possible on the KOK Platform!

Security

Vitalik Buterin: "Why don't we have a good solution to solve our security challenges yet? When will the problem of account hacking and theft be resolved?" Most blockchain comes with only compilers that create executable code. There are no tools for device testing, continuous integration, and code analysis. As a result, only simplicity protects smart contracts from security breaches. Complex smart contracts have inherent flaws and vulnerabilities, and many reports on security incidents have already been submitted. If better development tools were provided to developers, security incidents that cost significant damage could be avoided. Thus, KOK Platform is innovative in that it allows for complex functions and provides an efficient and productive environment for DApp. These are solutions to some of blockchain's biggest dilemmas.

1.2.4. Underdeveloped NFT(Non-Fungible Token) Technology

NFT as a Non-Fungible Token has its own unique value which makes direct replacement of each token impossible. On blockchain, NFT is mainly used for tickets, real estate, income status, Crypto kitties, coupons, etc., and it possesses property and profit based on its own number. NFT within Ethereum's ecosystem follows ERC – 721 standard and in the EOS ecosystem, it began its standardization in Open Source software domain such as dGoods or Simple Assets as a form of Working Group. In Ethereum, NFT is utilized typically on Crypto kitties and Decentraland, and it provides a unique characteristic as NFT. As various fields have started implementing this NFT blockchain technology, the concept about digital asset property has been clarified. Utilizing NFT can also solve the problem on existing digital asset property. As NFT technology was developed for utilization in the Ethereum ecosystem, it requires more development in case of EOS or other forms of blockchain.

KOK Platform refers to existing NFT standardization but it creates and operates its own NFT Specification that is optimized in KOK's ecosystem called the "Digital Contents Platform."

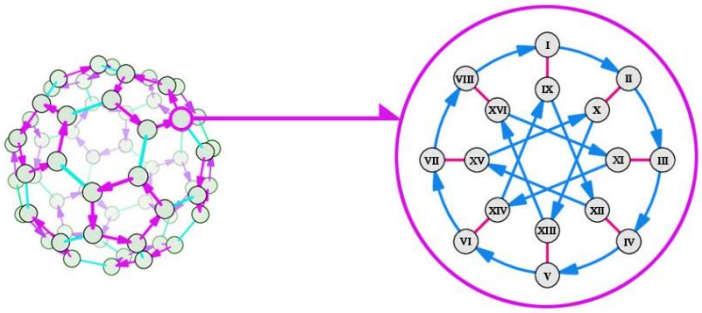




KOK Platform Structure

The DApp, which will run on KOK Platform, can be seen as a service group that forms a single district or a sector. One DApp is similar to how one portal service is structured in the internet service.

"BP" is selected based on the "characteristics of symmetrical structure" drawn from Group Theory. Participating primary nodes are responsible for developing the DApp ecosystem and demonstrating KOK Platform as safer and faster. In this symmetrical structure, DApp services find their similarities through "structuralization," comparing the number of transactions, the node distribution, and the time complexity generated within each DApp service structure. This similarity works to group them in one large group, and it overcomes the limit of existing blockchain by optimizing similar structures within the group. We define it as GOS-BP (Group Of Symmetry-Blockchain Producer).



KOK BP Organization: Structured KOK GOS-BP

A group of DApp services has a primary node that participates in the KOK Platform as a BP (Block Generation Node Block Producer Node), and is connected to this representative node to form its own DApp service ecosystem. This DApp service ecosystem resembles aspects to sidechains, but it does not have its own DApp coin, instead implements its function by linking and converging many Off-Chain services and DBs. Coins required for token explicitation including compensation, KOK, are allocated via KOK Foundation and used.

2.1. Protocol Blockchain Protocol (BaaP)

The internet of values and trust is called the next generation Internet, and the essence of the Internet is called WWW(World Wide Web). If so, KOK expects that the essence of the next generation Internet will probably be the next phase of WWBW(World Wide Blockchain Web), which is the next phase of the WWW. WWBW has to abide by Web Standard that is defined and managed by W3C, otherwise known as World Wide Web Consortium. Semantic Web that W3C currently defines, will be WWBW. Such blockchain is currently facing three dilemmas. Ethereum's founder, Vitalik Buterin, called these as the trilemma of blockchain. He also claimed that of the three characteristics of security, scalability and decentralization, all three cannot be achieved at the same time, and at most only two would be resolved. Many blockchains are trying to solve this trilemma. The same applies for KOK Platform.

Blockchain is often regarded as a technological commodity that possesses public property characteristics, and is viewed as a newly formed Economic Layer on the World Wide Web. Trust and fundamental values essential to the economical contract and transaction are guaranteed by the Economic Layer, the blockchain protocol. It seems creation of DApps are easier considering blockchain as the Economic Layer, and the World Wide Web is moving towards the next level; the WWBW - World Wide Blockchain Web. KOK Platform is one of these BaaP, which will allow many DApps to be easily designed on top of this platform.

2.1.1. BP Selection Algorithm (DPoSS)

The node that is delegated to generate the block and determine the main policy is called the Block Generation Node - Block Producer (hereinafter BP), and all DApps are eligible to become BP. The selected DApp provider is compensated for its role as a block generator. The methods and conditions of becoming BP are as follows:

① BP Selection Method

- BP is selected among DApp providers that provide highest quality DApp services.
- The selection method is ranked according to the votes of coin holders and service utilization rate.
- Selected BPs are compensated for block generation.

② Conditions to be BP

- In order for a DApp to become a BP, a node server must be established and operated.
- Server deployments cost approximately $500 per month for using cloud services with minimum specifications
- Even with investment costs, higher returns can be achieved with block-generating rewards.

2.1.2. BP Consensus Algorithm (PPBFT)

• Initially, KOK's MainNet is made up of 21 BPs; or 7 clusters consisting of 3 BPs in each Region.

- One BP has two logic layers. The upper layer is the Service Layer and the lower layer is the Communication Layer that is responsible for consensus. In case the DApp is dysfunctional or not ready to operate when the MainNet is launched, the BP representing DApps enters into the MainNet as a "Dummy BP" while running only the Communication Layer (lower layer).

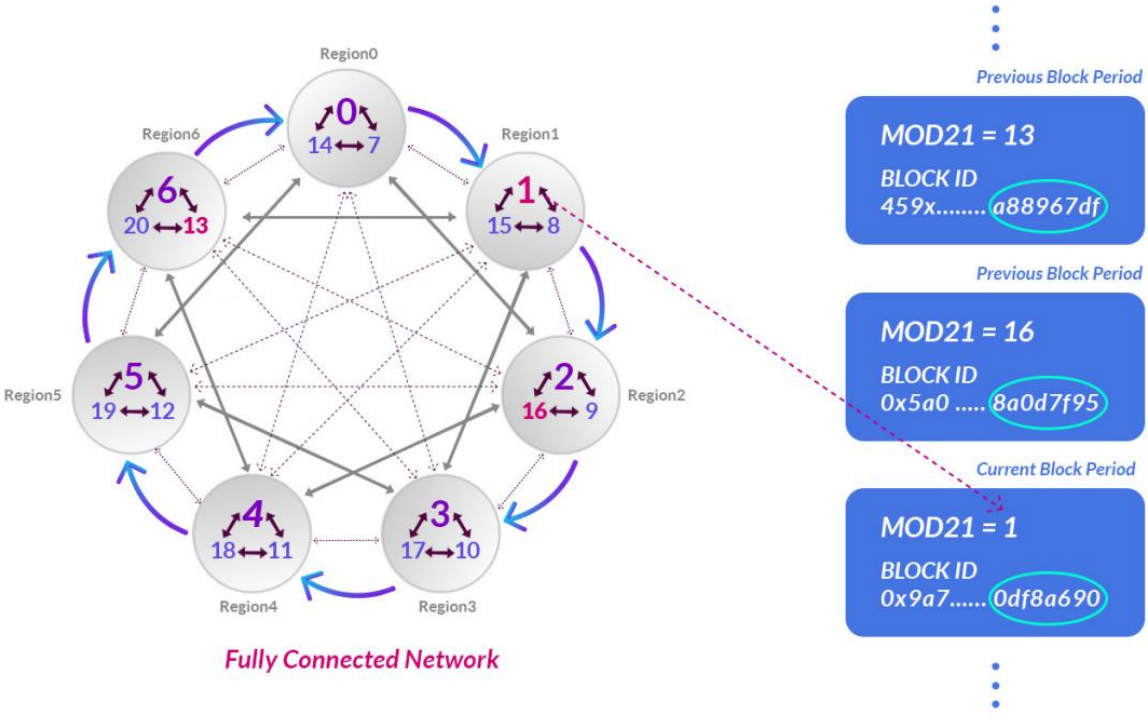
- The seven Regions are fixed before the start of the MainNet, taking into account the distribution of global telecommunication networks and the DApp.

- Each Region has its own index for its initial MainNet creation, called the Block Region Index (BRI), with numbers from 0 to 6.

- Each BP has its own index, which is called the Block Producer Index (BPI). The BPI is fixed at initial MainNet creation and the given number is from 0 to 20.

- The index for each BP extends to the adjacent Region and goes up incrementally in BPI. In other words, Region 0 has BPs with BPI 0, 7, 14, Region 1's BPs with BPIs 1, 8,15, making Region 6's BPs with BPIs 6, 13, and 20.

- A certain time zone where blocks are generated is called the Block Generation Period. During the period, one BP is responsible for the initial block generation and that node is called the "Primary BP." Twenty four blocks are created during the one block generation interval. (The number of blocks to be created in one interval can be adjusted through further simulation and testing)



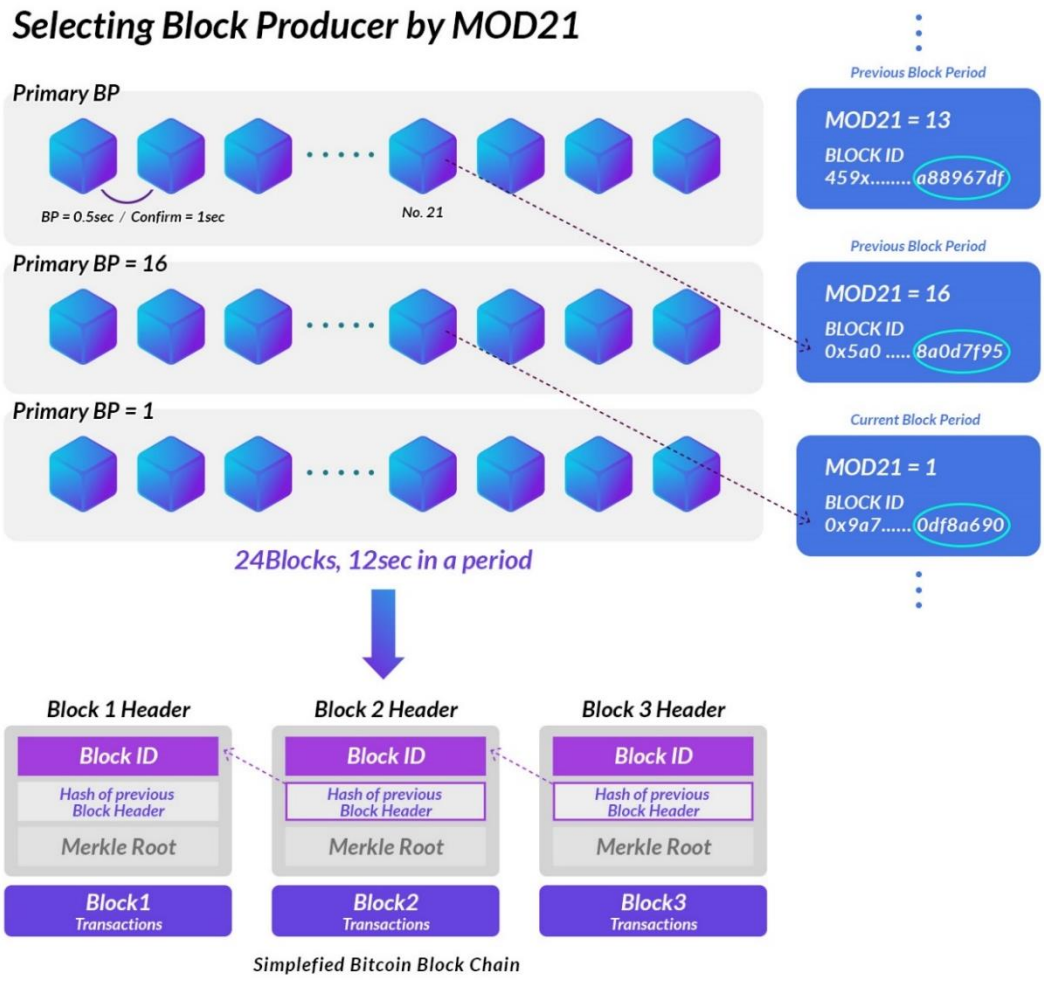
The “Primary BP” is determined during the previous block generation period. The method is decided by the outcome of function MOD21 which is a module for the last four byte value of the 21st block’s hash generated during the previous block production interval. The result of the MOD21 function is an integer between 0 and 20 regardless of its input value. This value is the exponential value of the BP that will assign it as the next Primary BP. (The block selected to determine the next Primary BP is currently fixed to the 21st block. However, the selection algorithm will be changed in a later version.)

- 6 BPIs are obtained by adding 1,2,3,4,5,6 to the index value of the Primary BP then applying the MOD21 function. These six BPIs are ‘Lead BP’ of each Region among neighboring BPs. In the block generation period, Lead BP serves as a leader to draw consensus in its Region along with Primary BP and notifies the result to the Primary BP.

- Primary BP propagates its initial block to the Lead BPs of neighboring Regions, and the Lead BP of each Region propagates the received block to the other two BPs of its own Region to verify the consensus. The consensus algorithm used is the PBFT (Practical Byzantine Fault-Tolerance) algorithm.

- Each Lead BP sends the consensus result of its Region to the Primary BP. The consensus algorithm used in this phase is again, the PBFT algorithm.

- The consensus algorithm applied comprehensively to KOK Platform is PPBFT (Parallel PBFT).



2.1.3. Decentralized Artificial Intelligence

On KOK Platform, AI is largely utilized. There are two main areas where AI is used; first, in accomplishing consensus among BPs, and second, when BPs perform contents curation and load balancing within their DApp ecosystem. Once these DApps obtain their own coin, this DApp becomes a sidechain to KOK MainNet.

Each BP cooperates with neighboring BPs by utilizing Decentralized Artificial Intelligence (DAI) to maintain the robustness within the KOK platform. In order for consensus network of BPs to obtain robustness, the selection of the Primary BP has to be unpredictable, and that is when the Primary BP can minimizes any risk of exposure to a hacker's extreme DDOS attacks. One of DAI's primary roles is to randomly select a Primary BP to achieve these goals.

A. In the early stage, 21 BPs are distributed in the 7 Regions and KOK's MainNet is launched, following the formation of the Genesis Block. Though some may be the Dummy BP, their Communication Layer still needs to function properly.

B. All BPs need to possess an identical "Confirmed Block," prior to creating the next Block. In other words, all of them are sharing a "Uniform State of Information" of KOK's MainNet with each other. If each BP activates a DAI code with their recent "Confirmed Block", other BPs can also activate the same DAI code in a similar condition which derives the exact same results. There is no need to compare the results with neighboring BPs. This is the very core concept of KOK DAI, an "Independent, yet together" algorithm of KOK DAI.

C. DAI code is also consisted of two areas. DAI-Consensus that operates at the Communication Layer (located in lower part of BP) and DAI-Application that operates at the Service Layer (located at the upper part of BP).



D. DAI-Consensus is operated according to the Logic below.

a. There are Consensus Parameters that are synchronized and shared among BPs, and these are included in the Block Header

b. One Primary BP generates several Raw Blocks during one Block Production Section.

c. Those parameters include the following elements

i. The current Primary Block Producer Index (PBI)

ii. The current Block production cycle, t (In seconds, the primary value is 0.5 seconds)

iii. The current Block production section, T (In seconds, the primary value is 12 seconds)

iv. Block Index to be used in the next Primary BP Index Production,

i(If the number of Blocks to be produced in the next production cycle is 'n', value of this Block Index is larger than 0 and less than ''n-1")

v. Hash Mask to be applied in the next PBI production (Among 64 bit; only 4 bit has 1 and the remaining 60 bits have 0. The primary value is 00000000 0000000F)

d. Once a Primary BP enters its Block production section, it has to define the Block Index and Hash Mask to be used in the next PBI production on Block Header of the first produced Block. Moreover, based on the current network's status such as Latency and Consensus Miss, it must also define the next Block production cycle (t) and the next Block production section (T) within the first produced Block. All these calculations can be performed prior to entering the next Block production section.

e. When all BPs come across the 'i'th Block Index defined on the Block Header, they perform the following specific calculations to decide the next PBI.

i. Apply Hash Mask on the value of this 'I'th Block and extract 4byte unsigned integer.

ii. This unsigned integer is added on the Modular(21) function, of which outcome, a value among 0,1,2,…,20, is chosen to be the index of the next Primary BP. The next Primary BP can prepare to perform its calculation from this point, even before the production of the next block section.

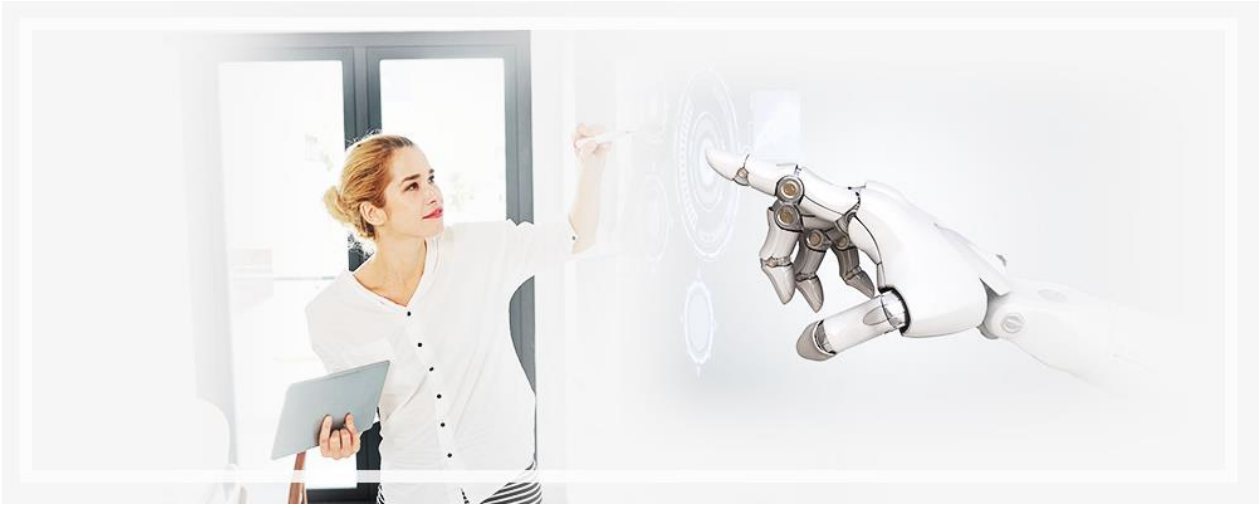
E. DAI-Application performs the following roles.

In the KOK Ecosystem, each BP is selected to be DPoSS algorithm, while taking a full charge on the consensus within the overall KOK ecosystem. Meanwhile, each of their DApp ecosystems contains their own individual business characteristics. BP performs AI services specialized in each application and reflects the outcome on the process to make a consensus among the BP network. This is the role of this layer.

a. Load Balancing within its DApp ecosystem.

b. Prepare candidates on the BP Bench to enter KOK's BP Network right away.

c. If one BP owns a sidechain DApp, it runs its individual MainNet that complies with DApp characteristics, and the BP participates in this sidechain consensus process via DAI-Application Layer.



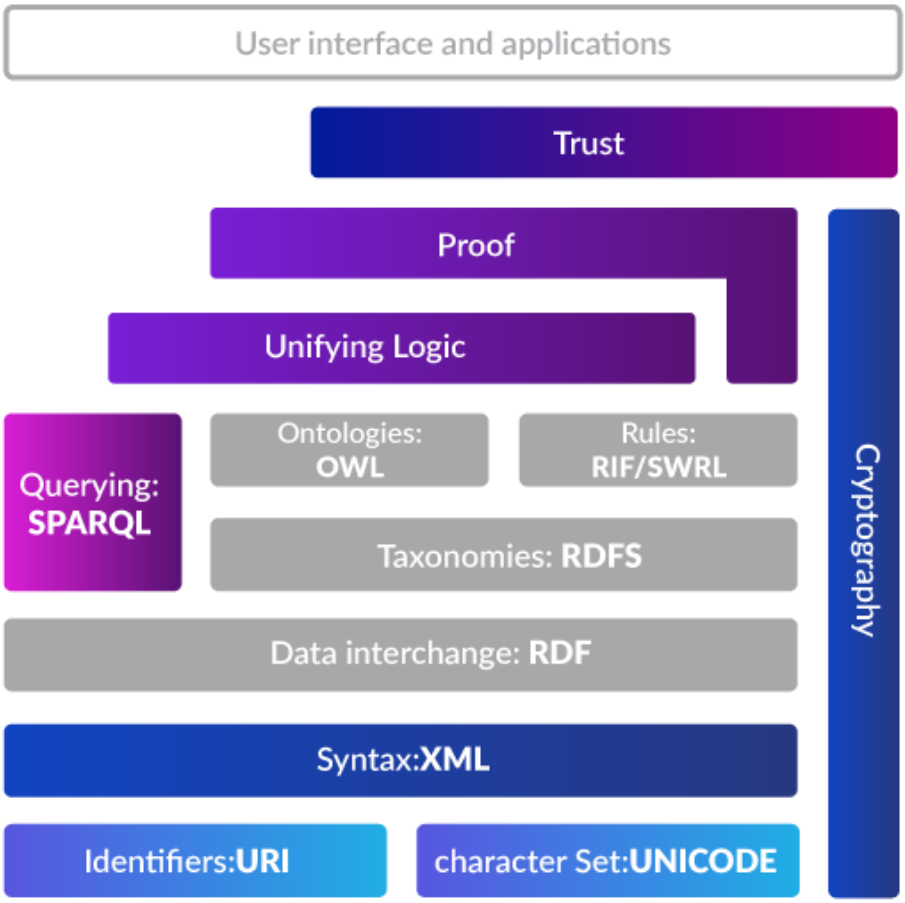
2.1.4. Open API

The DApp, which will run on the KOK Platform, can be considered as a service group that forms a single sector. It is similar to the portal service before the mainstream Internet came to fruition. A group of DApp services sector has a primary node that participates as a BP(Block Generation Node) in the KOK Platform, and establishes an ecosystem of DApp services around this representative node. In a wide sense, KOK DApp also exists within the Web ecosystem. So in order to Interface with the existing Web Resources that follows W3C standard and interwork with them is to comply with Open API and get aided by the Data Oracle that provides an Off-Chain data service.

2.1.5. KOK DApp Development Kit

KOK DApp Development Kit (KDDK) will be prepared for the development of DApp that operates on the KOK Platform. KDDK provides all the tools and environments needed to develop, test and operate the DApp to be launched on the KOK Platform. The environment in which KOK DApp operates can be widely seen as the Web environment. The Web environment and international standard is defined and organized by W3C, also known as World Wide Web Consortium. The true WWBW that KOK is trying to achieve has not expanded itself as a standard, but currently-defined form is similar to that of the Semantic Web. Therefore, KDDK is developed to produce DApps that corresponds to this definition, based on such environment. The Image below shows a Semantic Stack, the Trust layer being KOK MainNet. User Interface and applications located over the Trust layer will become DApp and its developer, KDDK.

The DApp created on KOK's Platform, can develop digital products such as game items in an NFT format. When developing this NFT token, it requires lots of meta data information such as token category, domain characteristics, and sales structure. Such information can be restored on Repository as somewhat of a standardized Template. KDDK connects these NFT Templates to be easily utilized.



Source : Wikipedia, Semantic Web Stack

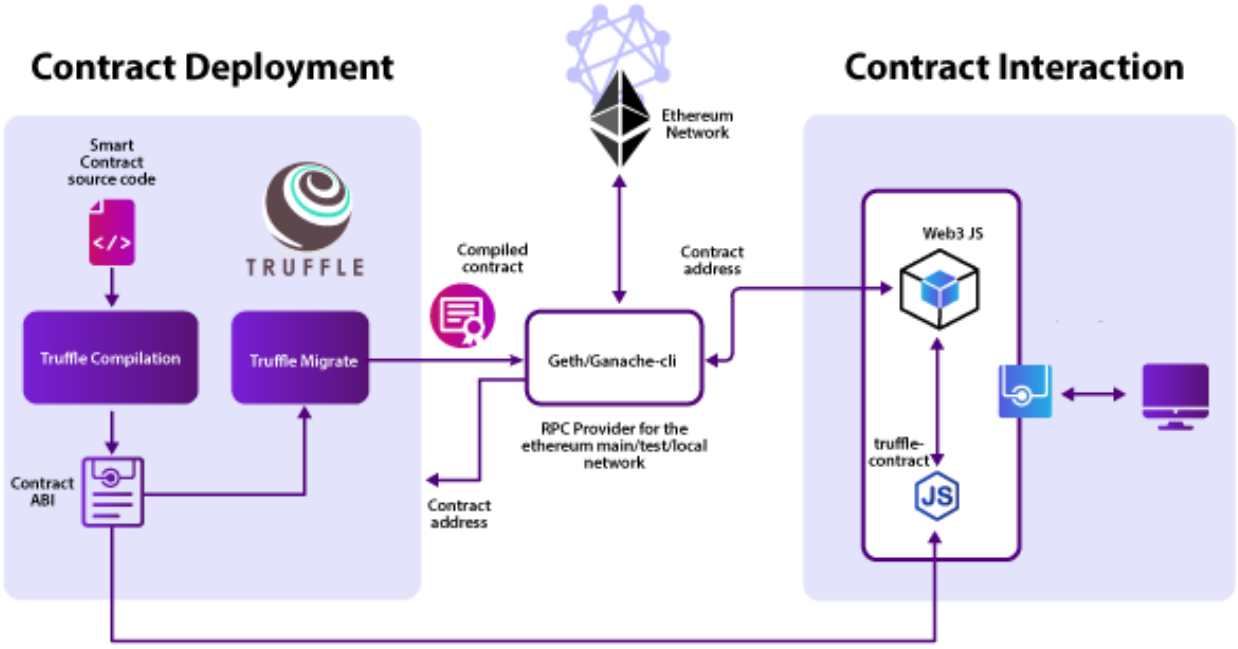
1. The background of KDDK Development

It is an enormous work to create computer program's Integrated Development Environment (IDE) or generate Development Tool Kit or Development Suite for developer's convenience. Especially it takes substantial level of technology to develop Tool Kit for Visual Programming. If we decide to move forward to develop Application software operating on Blockchain, namely to develop Integrated Development Environment and Tool Kit for producing DApp, it requires more complicated technology.

Fortunately, this Compiler Technology has evolved since a long time ago, and it exists in the form of Open Source software and many experts worldwide are participating in that Open Source Community. KDDK will surely be developed based on the existing Open Source software. A new Development Environment or Tool Kit is often generated by the combination of smaller Development Environments or existing Tool Kits. There are largely two types of Open Source software that contributed to the development of KDDK. Based on these two Development Tool Frameworks along with their open source, the design of KDDK itself will be specified.

•Truffle

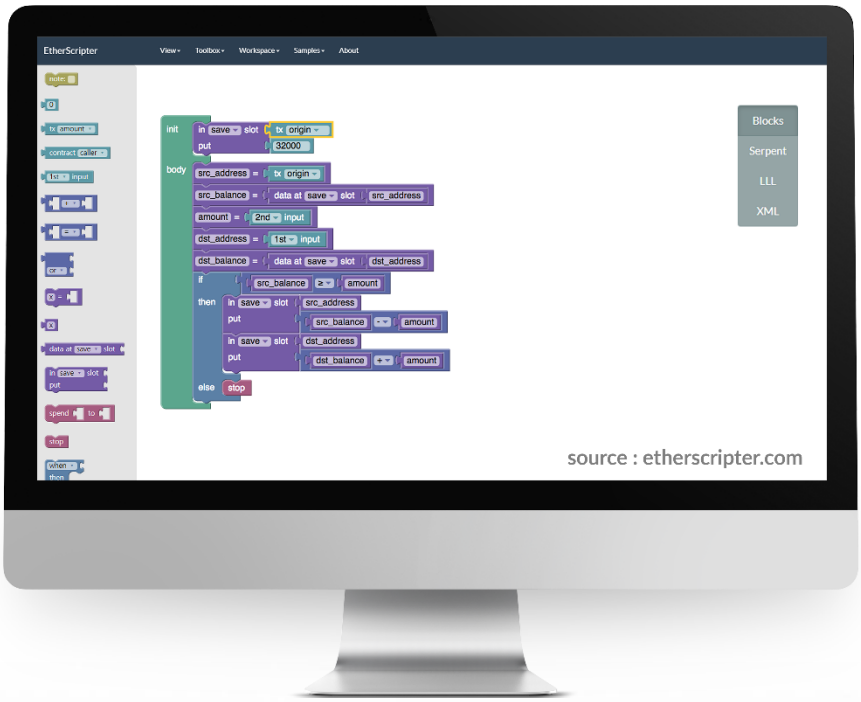
Truffle Framework refers to those that can easily compile and distribute a Solidity Code on local environment. DApp Development is largely divided into Front-End and Back-End, and Truffle Framework can be effectively used when writing Back-End Contract. Truffle provides commands such as compile, deploy, test, and etc that allow an easier way to distribute compiles of Solidity Contract along with its outcome packages on blockchain. It can also create a basic Development Environment via truffle init command. The image below shows the concept through which Truffle produces Smart Contract.



Source : hurondocs.readthedocs.io

- **EtherScripter**

EtherScripter is one of the most popular Graphical Smart Contract Editors that adopts Graphical Composing when creating Smart Contract, rather than writing programming codes. The screen below shows one sample of editing work on EtherScripter.



KDDK is designed with an objective to execute Truffle's powerful functions by using Graphical Drag & Drop method of EtherScript.

2. The Structure of KDDK

Normally DApp, an Application software that is operated on blockchain, is generated by the combination of Smart Contracts. It resembles those non-blockchain software packages in the past that was combined by modules. On blockchain ecosystem, the similar concept of these modules can be Smart Contract. Just like modules are formed by the combination of sub-modules, a Smart Contract can also contain lots of sub-Smart Contracts within itself. This software development method is called either Modularization or Information Hiding. While these established concepts that stems from software engineer history, they can also be applied in the development of Smart Contract and even DApp. KOK Foundation is largely interested in "Software Engineer for Blockchain DApp." although we do not currently handle this matter in this White Paper.

In order to compose Smart Contract in a form of Drag & Drop; the most fundamental and frequently-used Smart Contracts should be included in KDDK Template Library in a template form, composed on Graphical Edit Tool using Drag & Drop method, and those composed output should be packaged in order to be tested, debugged, linked and installed.

3. Open Source Community Activity

Since a lot of Source Codes of KDDK utilize Open Development Environment and Tool Kit within Open Source Community, KDDK has to follow rules of Open Source License of existing Source Code. Not only KDDK, KOK MainNet will also reveal its Source Code on GitHub. This License-related task will be performed by Compliance Officer within KOK, based on the industry standard.

All decisions related to governance and compensation system within Open Source Community will be handled by KOK Steering Committee. Moreover, KOK Development Team will be consisted of internal experts on important Branch of KOK Open Source, and they will be a Maintainer for each of their Branch.

KOK Open Source Community will improve KOK IDE performance and user convenience, with a Collective Knowledge by cooperating with KOK'internal developers. To achieve this, Tokens will be rewarded on the following activities within the community.

*Bug Report
*Bug Fix
*Regression Testing
*Security Testing/White Hacking
*Feature Upgrade Proposal
*Participating Hackerthon



KOK Ecosystem

The KOK ecosystem is designed to be connected and evolved organically by three main elements.

• **KOK MainNet:** BPs created based on GOS-BP concept connect to form a network of consensus. Token is the key cryptocurrency of the KOK MainNet and the KOK ecosystem.

• **KOK DApp:** Each DApp has one BP that represents it, and that BP manages the sub-ecosystem of that DApp, or DApp ecosystem. DApp is an integrated content ecosystem that provides a variety of digital content. The DApp ecosystem mostly uses token provided by the KOK MainNet, but in special cases, it can design its own DApp coin, in which case the exchange mechanism with the token will be described later. Having its own DApp coin represents that the DApp possesses its own blockchain. In KOK, those DApp blockchain becomes the sidechain. All BPs are equipped with Decentralized Artificial Intelligence (DAI), which maintains robustness within the whole KOK ecosystem.

• **KOK PLAY Platform:** KOK PLAY Platform is a device for sharing fair value of MainNet that BP forms with those MainNet and DApp participants. KOK Play Platform is connected also with DApp so the contents can be easily consumed.

3.1. KOK DApp Ecosystem

KOK Platform is an integrated content platform that provides a variety of contents which enables easier utilization of contents within the platform. There are mainly three themes consisting KOK ecosystem; KOK Media Platform, KOK Game Platform, KOK Shopping Platform, and it will expand more in the future.

The three main platforms in an early phase are categorized as Mega DApp. On this Mega DApp, there can be small-scale DApps with similar theme.

These three Mega DApp has a similar trait with Built-In DApp on KOK MainNet, so they are also referred to as 'KOK Base DApp'. A broader meaning of KOK platform includes these Base DApps.



Each platform solves the problems of existing services and utilizes blockchain technology to pursue the standard of the future platform in a more transparent and advanced form.

KOK Platform, which is creating the World Wide Blockchain Web (WWBW) through the blockchain, an Economic Layer , has designed the Token Economy that creates and profits from many DApp.

3.1.1. KOK Base DApp and Sidechain DApp

There are a variety of size and types of DApps created within KOK ecosystem. Large-scale such as Media, Game, Shopping are generated as Mega DApp platform, and there can be smaller DApps that coexists with Mega DApp. Of course, it does not mean that only Mega DApp is connected to KOK MainNet. In this sense, instead of distinguishing types of DApps based on size or scale, it is technically more comprehensive to distinguish them based on whether they possess their own coins or not. Base DApp refers to those using KOK as currency, the core coin of KOK ecosystem, and sidechain DApp refers to those which connects itself to KOK MainNet in the form of sidechain.

1. Base DApp

Base DApp refers to those that is operated on Built-In environment of KOK MainNet, and it is created by utilizing KDDK. Base DApp normally use tokens as its internal Utility Token. This kind of DApp does not require its own blockchain, but utilize KOK MainNet by itself. KOK Foundation is currently developing three types of Base DApps, and it is represented as a platform due to their large scale.

* Media Platform DApp
* Game Platform DApp
* Shopping Platform DApp

When Issuing Token of KOK MainNet, the needs of Base DApp was also considered. Each token economy of Base DApp and KOK MainNet is Tightly Coupled with each other.
As Base DApp is in the form of platform, more than 1 BP can be allocated considering the amount and speed of transaction within the DApp. For instance, there can be 3 BPs on Media Platform DApp, 3 BPs on Game Platform DApp, and 1 BP on Shopping Platform DApps on the early stage of KOK MainNet launch.



2. KOK Non-Fungible Token(NFT)

(Stating function of NFT and definition as Base DApp)
Token items that are created within KOK digital content platform can be categorized as below.

- Fungible Token
- Non-Fungible Token(NFT)
- Semi-Fungible Token(SFT) that provides the combination of FT and NFT.

Every token items within KOK ecosystem are created by Smart Contract. Smart Contract, while similar with Back-End server, is operated on blockchain. This blockchain integrates with KOK MainNet as the form of KOK Base DApp when operating. The user of token item interacts with Smart Contract via API like Actions, and the ongoing data is saved on Tables. That means, operation is on Action, and data is saved on Table. Table can also expand into Off-Chain data storage or On-Chain data storage like IPES. Moreover, token items should be able to contain lots of Metadata for transaction, domain langualization, group transfer, and etc. Meta datas are managed in a form of Templates to facilitate coding. In order

In order to implement KOK NFT, the following functions are necessary.

Actions

- SetConfig – Manage environment variable and Version
- Create – Define the creation of Token and its fundamental property (replaceability, possibility of sales, possibility of burning, possibility of transfer, and Maximum supply-, etc)
- Issue – issue token
- PauseXfer – pause every transfer of the token
- BurnNFT – Burn NFT token
- BurnFT – Burn FT token
- TransferNFT – Transfer NTF Token
- TransferFT – Transfer FT token
- ListSaleNFT – Return NFT token that was listed on NFT token sale.
- FreezeMaxSupply – Freeze the current supply as maximum without additional token issuance.

Tables

- TokenConfigTable – Along with SetConfig Action, manage global data environment and version of the token
- StatsTable – Save the status information of basic property(replaceability, possibility of sales, burning and transfer) while guarantee uniqueness of the created token name and its category
- TokensTable – Global Repository of every created NFT, SFT token
- CategoryTable – Save every category names when tokens are generated
- AsksTable – Listing to sell KOK DEX token
- CloseSaleNFT – Save every token name that was sales listed on Decentralized exchange
- LockedNFTTalbe – Save token names that is unable to transfer because of temporary lock
- AccountTable – Save the amount of a certain NFT token of a certain category regarding one user account and information of fungible token amount

Metadata plates

- Various possible Templates based on types of token, ex) 3D Game, 2D Game, Art, Ticket etc
- Templates can be connected to DApp Integrated Development Environment(IDE) and KDDK.
- Templates can be developed in a form of Repository and can be sold.
- Template is defined as JSON Object or XML.



3. Sidechain DApp

In case of sidechain DApp, it possess its own blockchain and coins. Both fixed and unfixed exchange rate can be used between KOK and its own coins, and the coins can be utilized as a customized form based on rewarding system and governance of the DApp ecosystem. This self-blockchain works as KOK sidechain that participates on MainNet of KOK DPoSS and PPBFT Technology.

Technically, BP nodes of sidechain DApp from KOK MainNet's perspective and KOK Gateway Node from sidechain perspective are the same. This node is structured with Communication Layer in the lower level and Service Layer in the upper level, and the latter layer contains logic (module) regarding the consensus of sidechain MainNet.

When composing KOK Gateway Node in the perspective of sidechain, the node is designed to fulfill a certain level of specs and conditions that enables itself to role as BP of KOK MainNet.
This Gateway Node requires the installation of modules such as DAI-Consensus and etc that participates in KOK MainNet Consensus, and the communication between these two layers is performed via Open API.

4. Token Economy of Sidechain DApp

Since sidechain DApp possesses its own MainNet, issuing its own token is not an unusual process. If DApp issues its own token, the amount of token circulation is increased within KOK Ecosystem. When issuing sidechain DApp token, one has to consider the amount of issuance based on the scale of blockchain economy that the DApp is operating. If we issue big-scale token in economy with low scale and low growth potential, it is as if KOK ecosystem is inducing redundant inflation problem.

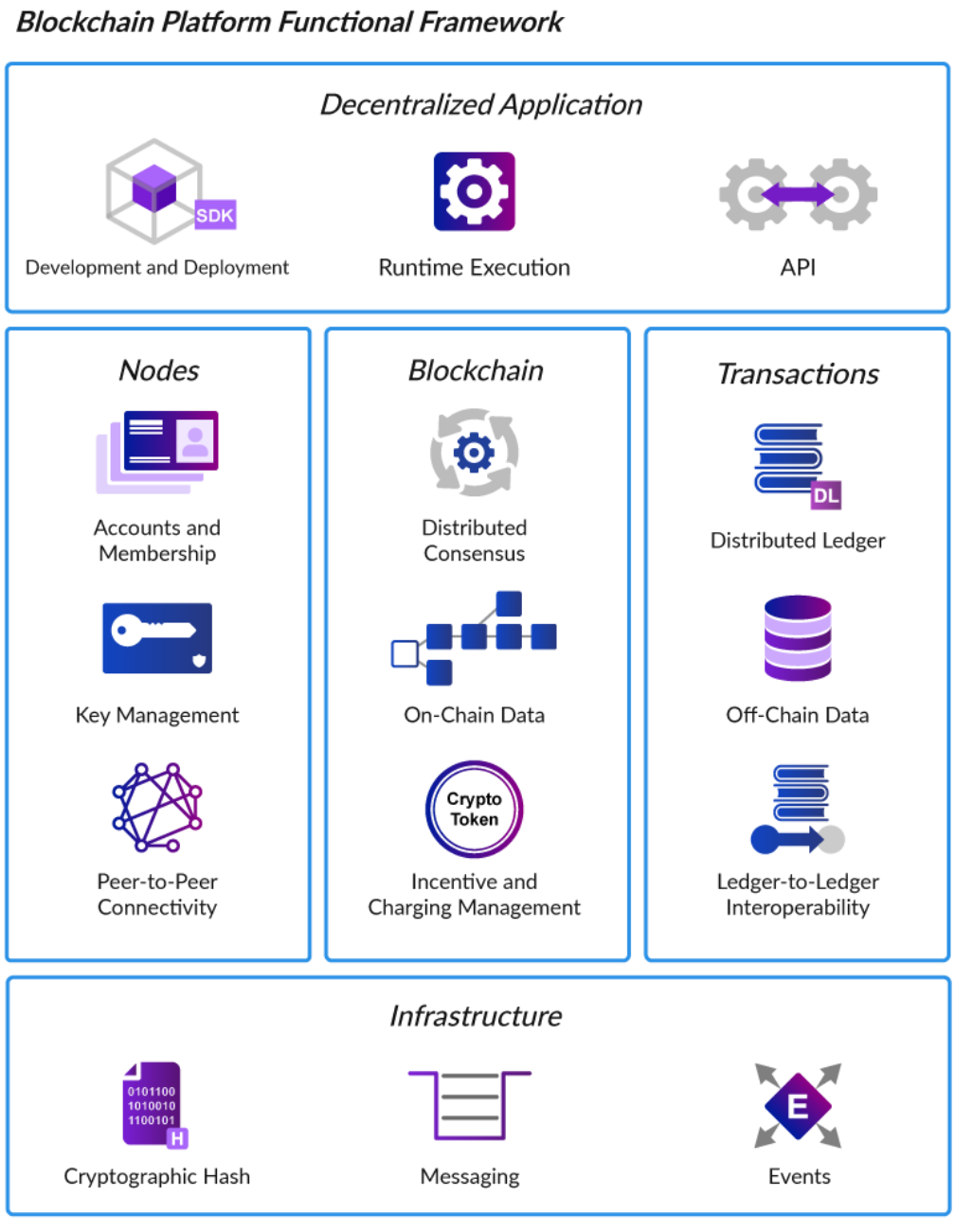
On the other hand, if DApp issues token in much smaller scale, the dynamicity for DApp's growth can be restricted. As a result, considering the overall KOK ecosystem, it is very important how to decide the relationship between this DApp token and KOK key coin. Below are two methods to design DApp Token Economy in KOK ecosystem, and 'KOK Council' within 'Decision Making Structure', the top level in KOK governance structure, participates using Deliberative Voting.

*Tightly-Coupled DApp Token Economy
The exchange rate is fixed between token and DApp Token and the total issuance is ultimately decided by KOK Council.

*Loosely-Coupled DApp Token Economy
The exchange rate is variable between token and DApp Token. The total issuance and the initial exchange rate is set by KOK Council.

5. DApp Development Methodology

DApps within KOK ecosystem have a characteristic of Blockchain Transformation. That is, it may contain lots of modules, DB and portals that are operating on existing Internet and centralized environment. According to what Gartner suggests, DApps that possess a characteristic of Blockchain Transformation has a concept Architecture as below image.



[Source : Gartner,March 2018]

DApps within KOK ecosystem are also operated in this large frame. Especially among them, considering that KOK ecosystem is Digital Contents Platform, the compatibility between lots of heterogeneous Off-Chain Data and logics is regarded important.
The below is a categorization of what function KOK MainNet Blockchain offers to KOK DApp.

- Front-End
    a. Direct Transaction between creator and user.
    b. A reasonable compensation for participants.

- Back-End
    a. Transparency of transaction information
    b. Decentralized platform
    c. No contents forgery

In order to maintain the robustness and expand further, DApp Development Environment, Took Kit, and DApp run-time environment are three important considerations.

Traditional software engineering methods can all be utilized as DApp is developed through software, but since KOK DApps are often the result of upgraded software outcomes, Agile methodology or Re-engineering methodology are more recognized. There is no apparent outcome; nevertheless as there is more DApp development, the current software engineering will evolve itself to software engineering for blockchain and DApp Development methodology.

In order to expand DApp, KDDK will be designed to provide Graphical Programming method using Drag & Drop way instead of Programming method.



Each platform solves the problems of existing services and utilizes blockchain technology to pursue the standard of the future platform in a more transparent and advanced form.

KOK Platform, which is creating the World Wide Blockchain Web (WWBW) through the blockchain, an Economic Layer , has designed the Token Economy that creates and profits from many DApp.

3.1.2. KOK Media Platform

KOK Platform resolves problems arising from existing media such as YouTube, Facebook, Netflix and Tungshin Spin(Tencent Video), which combine blockchain to create a transparent form of blockchain-based media video platform.

Ⅰ. The Issues of Existing Media Platforms

Existing media platforms have problems such as 'measurement of advertising fees', 'distribution of revenue' and ' protection of personal information.'.

On YouTube, on average, more than 1 billion hours are watched by platform users a day, but there is a conflict of interest between advertisers and platform executives. Issues that are difficult to solve in centralized systems, such as opaque revenue sharing between Contents Creators and platform companies, and the theft and hacking of personal information data, such as Facebook information leaks, have recently emerged.

In addition, issues such as compulsory viewing of advertisements by platform users and view abusing to generate revenue for creators are being raised, and additional issues must be solved to reduce economic losses incurred in the media platform.



Ⅱ. Blockchain-based Media Platform

(1) Problem Solving between Advertisers and Platforms

Unlike the fact that advertisers want to effectively place ads on certain channels where ads can be exposed to desired target audience, advertisers complain about "targeting" and "efficiency of advertising" and pay less due to the existing platform's placement of ads on the viewbot and on the unhealthy contents. As a result, content creators complain about reduced revenue and centralized platform.

Remove the 'Viewbot' Abusing

The process of distinguishing 'viewbots' from general users can seem quite complex. In the KOK ecosystem, users can freely consume based on KOK Token. Therefore, the criteria for screening real users of KOK Token are determined by setting specific conditions for consumption of KOK Token, and distinguishing them from the 'viewbots' to simplify the problem of distinguishing them from actual users.

We discriminate real users with ‘viewbots’ by three devices; Identification verified KOK Token ‘mining’ within KOK Platform, a certain amount of KOK ‘Token Consumption’, and ‘Users Activity’. In addition to the media, as our platform is operated based on based the consumption environment of user online such as use of KOK Token in games, music services, e-commerce, etc., it is not difficult to distinguish between real users and "viewbots.”

Improve the Efficiency of Advertisement & Targeted Advertisement

In blockchain, it is not possible to manipulate ratings and reputations. Transparency in the absence of an “abusing bot” becomes a powerful advantages. Advertisers will be able to distinguish high-quality channels and videos through ratings within KOK content platform, and to advertise efficiently based on data provided by viewers. Advertisers purchase KOK Token in the market, and the purchased KOK Token is consumed again by platforms, users and creators, so the ecosystem of KOK Token is completed in the form of a virtuous cycle.

Competitiveness between Channels and Videos

To limit the competitiveness of inappropriate channels, the channel will be evaluated using KOK Token. Using cryptocurrency to grade the system is very helpful in terms of vitalizing the ecosystem. However, when looking at the case of introducing a rating system using cryptocurrency, similar to this among DApps already in service, users are looking to increase their ratings on each other in order to get a big reward, resulting in problems that are much different from their previous intent.

To be recognized as a regular user, “abusing bot” must 'spend' KOK Token within KOK Platform, and ‘be active' within the Platform ecosystem for a specific period of time. These requirements effectively reduce the economic added value of the abusing bots and limit the approach.

KOK Platform effectively blocks the abusing users, and uses KOK Token to establish the subscriber and video rating system of the channel.

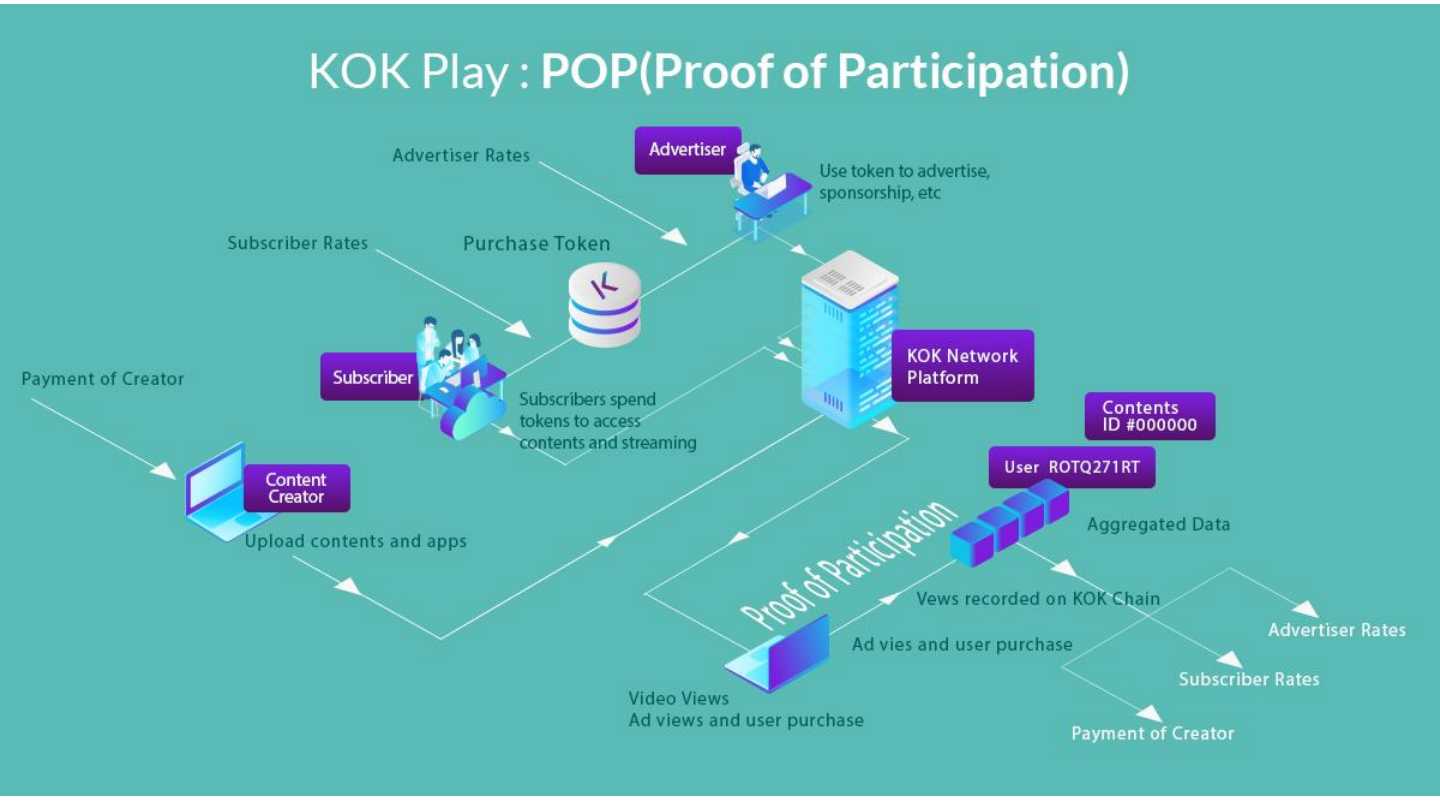
Users who consume KOK Token and watch are able evaluate the videos, and users who consistently make the appropriate evaluations receive more rewards than KOK Token they spent in their evaluations and subscriptions for providing "viewer data" to the platform.

The channel "Subscription" is proceeded through KOK Token mining and limits the total amount of mining, making the channel with a large number of subscribers highly influential. By providing rewards to channel creators according to the total number of mining on the channel, effectively producing quality channels and screening.



(2) **Issues between Creators and Platforms**

The process of ‘profit payment’ that content creators receive, which is currently the most problematic issue for video platforms, is one of the best issues to address when utilizing blockchain. In existing platforms, considerable conflict with the platform occurs due to issues such as the 'payment period' or 'transparent payment' for advertising fees, and the 'modification of algorithm policies' in which the creator is paid.



The Proof of Participation (POP) solves the problem in the form of a participation proof method in the following ways:

1. Watch time for a certain N hours.
2. Click on in-video ads
3. Number of video ratings

The KOK media platform's algorithm calculates all interactions in content, stores each user's video viewing data in a blockchain, and pays the content provider transparently. Payments of these costs are generally paid in proportion to viewing time, supported by an auxiliary content evaluation algorithm, measured and paid precisely.

(3) Issues between Users and Platforms

Media such as YouTube and Netflix have begun to emerge, and personal data has also become important assets. Recently, the biggest problem with Facebook and YouTube has become a social issue as privatization of individuals' data, which is not in the form of rewards for users.

In particular, Facebook's recent leak of personal information has been a shocking incident around the world, and the encryption of such identity data is considered an essential. On KOK Platform, identity data is encrypted and stored in blockchain, and data required by advertisers such as type of individual viewing and viewing age are collected with consent and compensated with KOK Token.

Ⅲ. KOK Media Products

KOK Platform provides its own media products in addition to media platforms that allow platform users to upload and share videos. The media products autonomously are shared with people around the world by uploading music, dramas, entertainment, movies, and performances that have already been released to the market with a business value.

With K-pop (Korean Popular Music), which is gaining huge popularity around the world, the company aims to provide music services in conjunction with the KOK PLAY platform and Korea's flagship music platform, which can introduce, stream and download pop music.

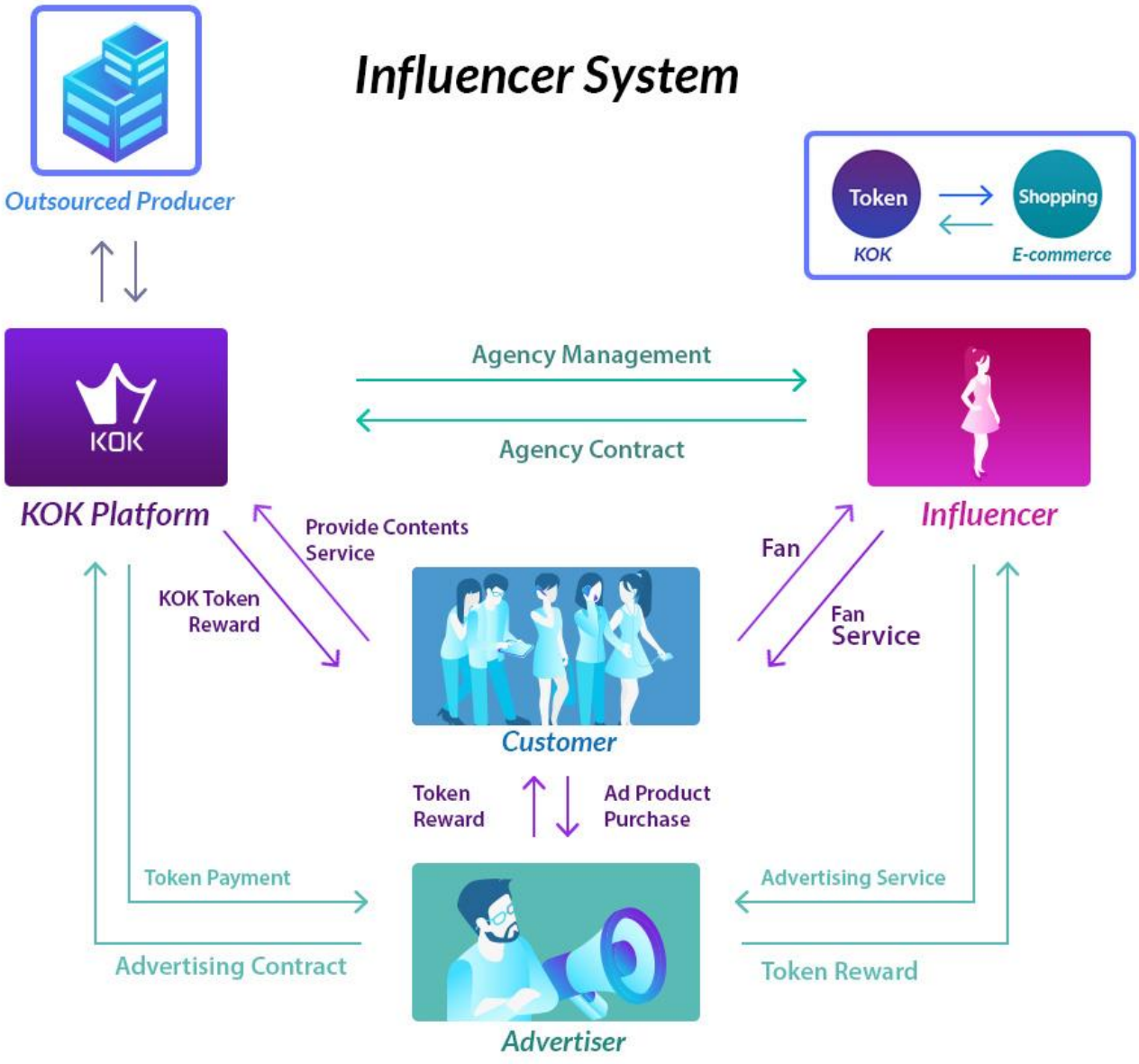
In addition to K-pop, representative dramas of Hallyu is also provided by KOK PLAY platforms, and services representative entertainment of various channels, including original KOK PLAY Entertainment. KOK PLAY platform also serves films of various genres.

By holding performances of representative artists for K-pop and performance of overseas artists, the live broadcasting of performance service is provided by KOK PLAY platform, along with ticket sales for performances.



Influencer System

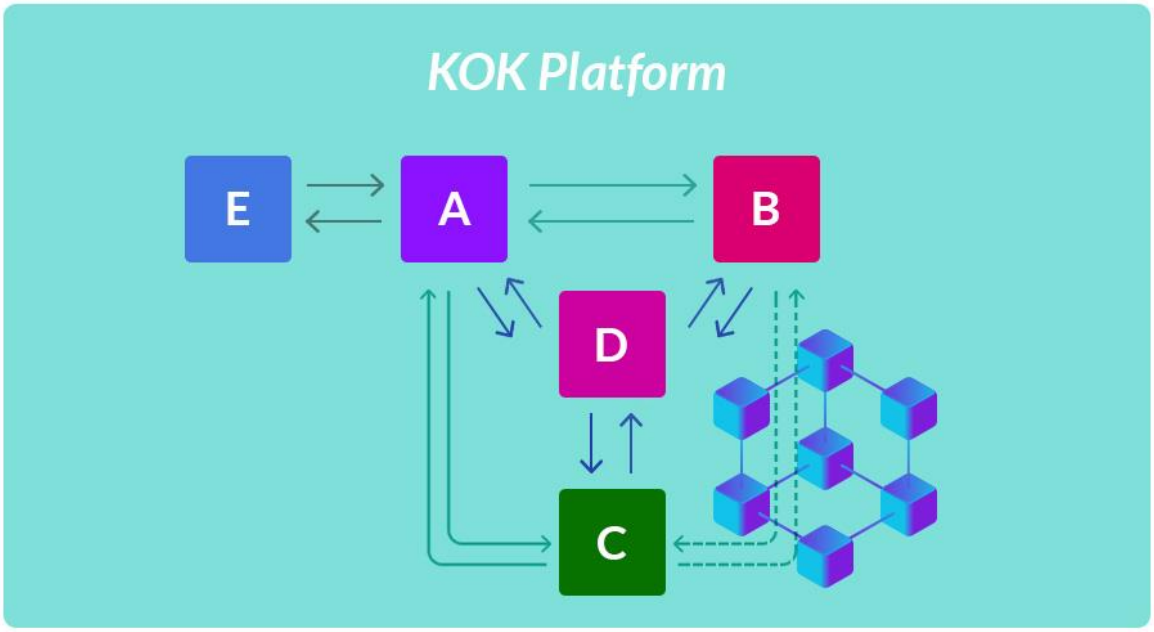
KOK Platform supports the activities of influencers within the 'KOK Media Platform.' Influencers with great influence and potential in the cultural industry and e-commerce market appear on various media content on KOK Platform and attract users' attention. Influencers provides content to users, and users can express their interest in the influencers with KOK Tokens. Advertisers can also request advertisements from the influencers through KOK Platform, and advertising fees are executed through KOK Token. Advertising contracts within these platforms contribute to the increasing value of KOK Token in the market and the active transaction of KOK Token.

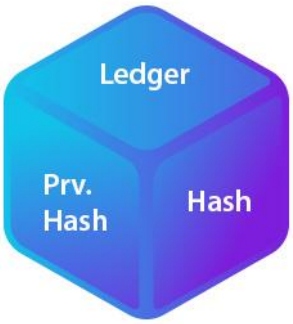


Transactions between nodes form a block with tokenized reward tokens, and are traded within the platform. KOK Platform transparently discloses transactions to enable trends analysis of reward tokens among advertisers, influencers, and customers and analysis of data through token.

IV. Copyright and Cloud Funding, NFT

Each media content (music, movies etc) serviced on the platform is issued as NFT, and all participants on the platform can freely trade copyrights of the creation via Dex exchange. If NFT is issued when the creation is initially published, the NFT is issued with the publisher as its owner, while KOK Token is used in trades when registered on Dex exchange. In order to transfer the copyright of the creation, the agreement on Smart Contract containing the related issue is necessary. The copyright can also be traded partially. Of course, NFT can be issued with incomplete contents which also enables Cloud Funding. Also, platforms in this case also provide Escrow function that release the lock ups based on contents production stage, in order to protect those who participates in Cloud Funding.





[Node code]

A: KOK
B: influencer
C: Advertiser
D: Member
E: Production

Node code

A-B : Contract
A-C : Contract
A-D : Agreement
A-E : Contract
C-D : Rewarding
C-B : Advertiser

3.1.3. KOK Game Platform

1. Problems of the current game industry

Problems in the existing game industry can be summarized into three; standardization of games, asymmetrical profit structure in favor of few over-payment users, high expense for development and marketing. First, standardization of games refer to concentrated development of genres that mainly entails financial benefits that has success precedent, and additionally, the phenomenon where the similar contents are created in order to make over-payment structure no matter what genre of game.

These contents are structured to gain most of the profits from a few over-payment users, who spend 10 times or even 100 times larger amount of expense on the game. These users are so called 'Whale Users' and they can consist 80% of the total profit and sometimes maintaining these users can determine the success or failure of the game management. This results in the overall decline of users' satisfaction as the game balance gets distorted in favor of these few users. Furthermore, as the life span and profit is determined by these users, the profit structure gets weakened, which would ultimately affect the management of the company.

Games could be developed with better quality thanks to the development of technology, it also requires higher development fee in order to fulfill users' needs. Moreover, developer company all over the world have to compete at the same time as the barrier of market entry has lowered due to global game platform, and this caused higher marketing expense to recruit more users. This is the biggest cause for profit deterioration of game companies where they choose to develop previously successful genres or those with high profit in order to achieve bigger success, which ultimately resulted in asymmetrical profit structure and standardization of games.

2. Platform Monopoly and Necessity of Decentralization

Most current games are serviced by a global giant monopoly platform such as Apple App Store, Google Play, and Steam. These global monopoly platform enabled faster globalization of game industry, but it also contains problems as it accelerates profit decline in two aspects below which is the most fundamental problem that game industry faces.

The first is high fee. As Apple App Store implemented app fee up to 30% of the total profit, 30% app fee has already been a custom among platform industry. Moreover, developers are not provided with enough service to recruit users despite of having to pay substantial amount of app fee. This is due to limited contents exposure on the platform. Even platform exists with a main objective to recruit users, developers virtually get no benefit while they still have to pay for not only app fee but also additional marketing expense.

Especially, as App Store is the only way for iPhone users to enjoy game service, they had to pay 30% of the total profit to Apple as long as they want to sustain iPhone users who consists more than 30% of the total game market. When considering the average sales revenue of game company is 10~15%, 30% is a very high number and this forces game companies to make more stable decision.

The second is monopoly of curation right. As platforms expose very few games in a limited space, the more games are exposed, the higher profit they will get. The problem is, all rights about curation are property of the platform and only games that coincide with that platforms want will survive. This results in gradual change according to the taste of platforms, and platforms voluntarily censored games asserting their powerful right for curation which ultimately resulted in games standardization. Furthermore, platforms required higher advertisement for better exposure, which deteriorated the profitability of game developers due to high marketing expense.

It is indisputable that global contents platforms such as Apple App Store, Google Play, and Steam have exerted great influence in game industry so far. Nevertheless, these platforms are exerting dominant power over the market by monopolizing and this will be the major factor that disrupts game development in the long run.

To solve these problems, digital contents platform KOK PLAY provides decentralized game service through implementing blockchain technology.

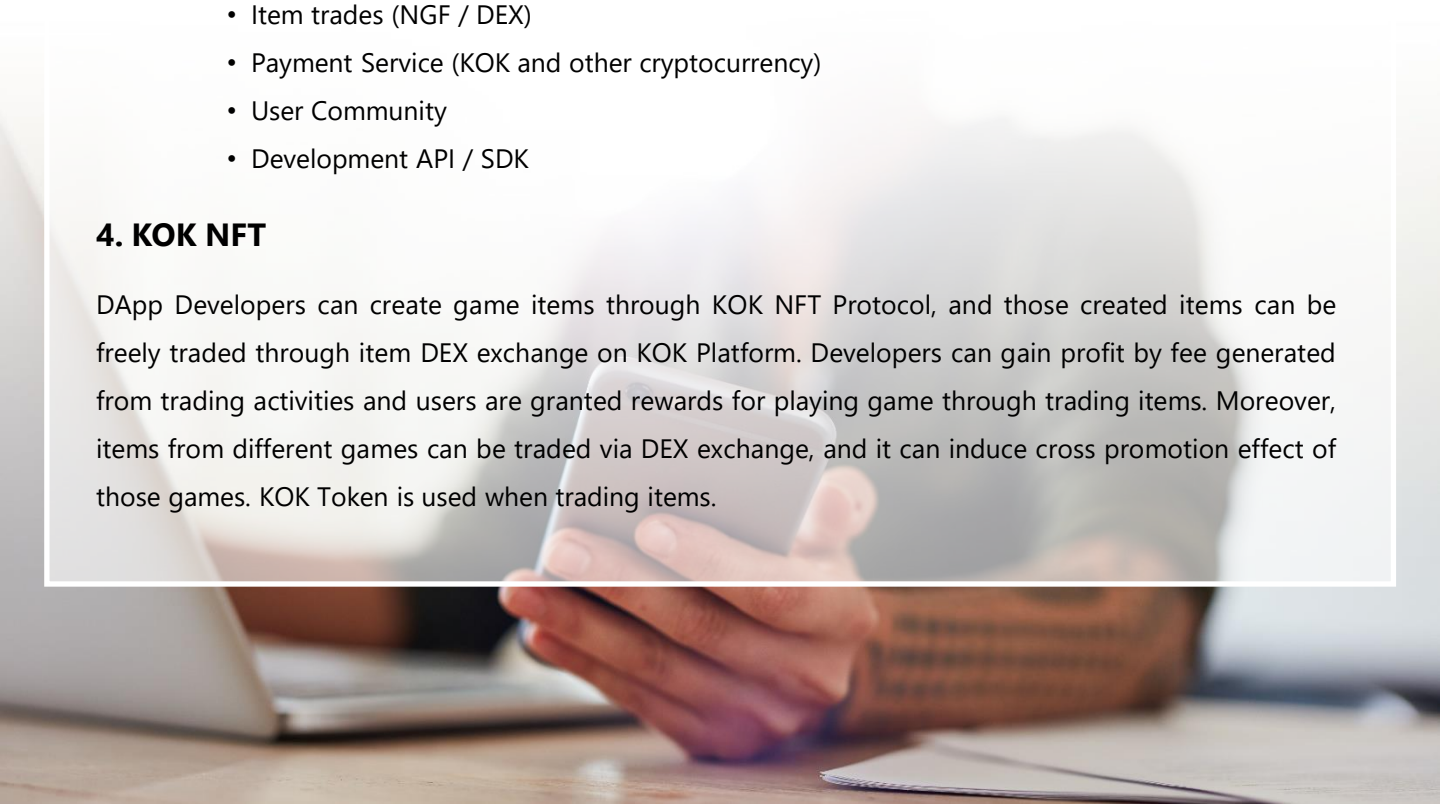
3. KOK PLAY Game Platform

KOK PLAY game platform is a decentralized platform utilizing KOK blockchain technology and has following characteristics.

- Low Fee
- Decentralization of curation
- Advertisement matching service optimized to viewers.
- Distribution and Advertisement of games
- Item trades (NGF / DEX)
- Payment Service (KOK and other cryptocurrency)
- User Community
- Development API / SDK

4. KOK NFT

DApp Developers can create game items through KOK NFT Protocol, and those created items can be freely traded through item DEX exchange on KOK Platform. Developers can gain profit by fee generated from trading activities and users are granted rewards for playing game through trading items. Moreover, items from different games can be traded via DEX exchange, and it can induce cross promotion effect of those games. KOK Token is used when trading items.



3.1.4. KOK Shopping Platform

As Ethereum's founder, Vitalik Buterin, noted, blockchain technology is more suitable for proof of inexistence rather than assurance of the value. For instance, if you trade luxury goods and attempt to use blockchain for proving its transaction, occurrence of the transaction can be proven. However, you cannot prove the actual value of the transaction. In other words, you cannot prove that the traded good is a luxury or not.

If blockchain has the difficulty of proving its existence, we need a trusted institution to confirm its existence and an equipment to perform corresponding activity.

Blockchain refers to a P2P type of personal-to-person transaction system with no specific manager or owner. Similar to traditional download methods in P2P format, blockchain technology proves the transaction content by storing it on globally distributed computers.

As mentioned earlier, such blockchain is able to prove the non-existence but not suitable for confirming its existence. Therefore, the blockchain requires a transaction with 'trusted institution' or 'trusted person.' Rather than being stored in decentralized ledgers, these trusted institutions or persons require guarantees of government and agency, or separate supervisory.

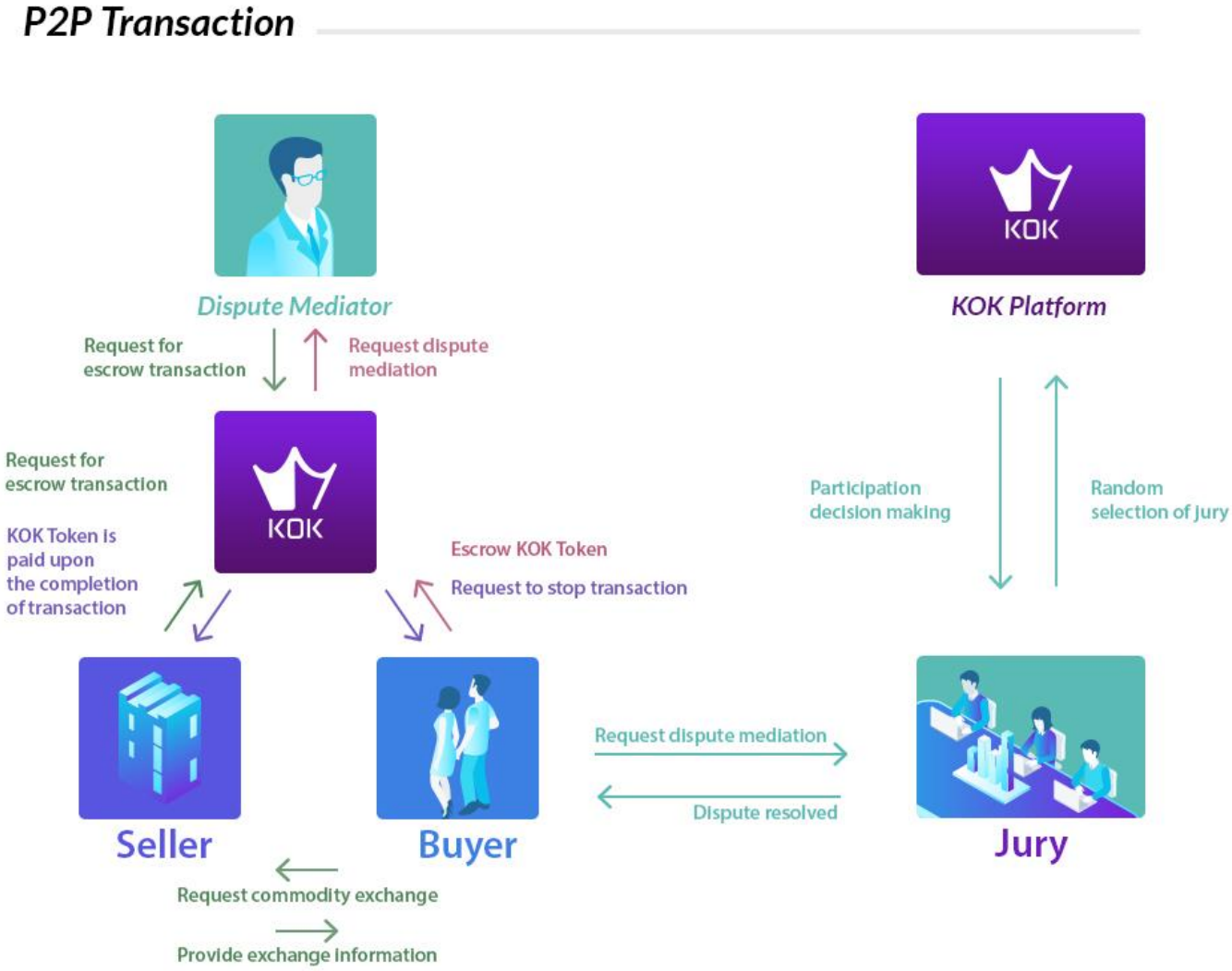
KOK Platform guarantees property and goods traded among KOK Foundation and external regulatory institutions(or certificatory agencies). The platform also supports transactions between individual and business(B2C) and among individuals(P2P) on specific goods or services.



Ⅰ. Transactions between Individuals (P2P)

Fraudulent activity by buyer and seller is the first issue that need to be prevented in terms of transaction of goods or products between individuals. The purchaser will place the "KOK Token" or other cryptocurrency in escrow account(e.g., "USDT") before the transaction, and the cryptocurrency in the account can be withdrawn with the consent of two out of the three parties. Transaction commonly take place with the consent of the purchaser and two sellers, but withdrawal can also be made after elapsing a certain period of time in case of no-objection from the purchaser.

However, in the event of a dispute between the seller and the buyer, a third party shall intervene to handle the dispute. Seller and Buyer select 'conflict mediator' based on the mutual agreement reached after analyzing reputation and ratings within the community. Then they request one to participate the transaction as an arbitrator. These systems are intended to establish a decentralization network that does not involve any intermediate interventions.



• The Conflict Mediator

Anyone within KOK Platform can be a "Conflict Mediator." “Conflict Mediator” plays an active part within the community and gets a chance to be selected. Rating of the mediator can be increased based on the commission received after resolving the dispute. Furthermore, buyer or seller who lost in the conflict can request KOK Platform to reconcile the dispute, so the transaction can be paused. If KOK Platform raises objection to the dispute, one can demand additional ruling by paying extra charge. KOK Platform elects “Jury” through random selection within the community and allows them to resolve cases internally. If there is a legal problem subject to certain country, the transaction is suspended in accordance with the law of the country concerned. If the legal issue is raised based on the ‘international law,’ corresponding transaction is discontinued in accordance with international law.

• Jury

To create equivalent jury selection process, a random hash value, generated by the KOK internal transmission, is converted to select juries from 100 ‘conflict mediators’ who are ranked high in the community. To Prevent manipulation, the whole process of converting hash value is disclosed for the complete transparency and the result random value can be verified. This effort of creating the fair process and results forms trust among stakeholders. Adjustments are resolved according to the majority's opinion, and if the majority does not agree, the jury's screening and dispute settlement process shall be repeated until majority consent is obtained.

• Dispute Mediator and Jury Compensation

Dispute mediator and jury are compensated with a certain percentage of sales when the dispute is resolved.

Compensation will be rewarded with KOK Token and will increase the rating within the “KOK Shopping” platform community. The rating can increase the probability of being selected as a “Conflict Mediator” in the future cases. As a result, the cumulative revenue occurred by the dispute resolution can be significantly raised.



Ⅱ. Transactions between Individuals and Businesses (B2C)

For transactions between individuals and businesses (B2C), goods and services from a number of proven partners (branding) are provided within KOK Platform. Goods and services within the KOK Platform ecosystem will be a window of opportunity to promote to people around the world within KOK Platform ecosystem, while Korean wave content and products offered by KOK will bring huge marketing effects to KOK Platform.

*KOK :Analyzed Custom Data

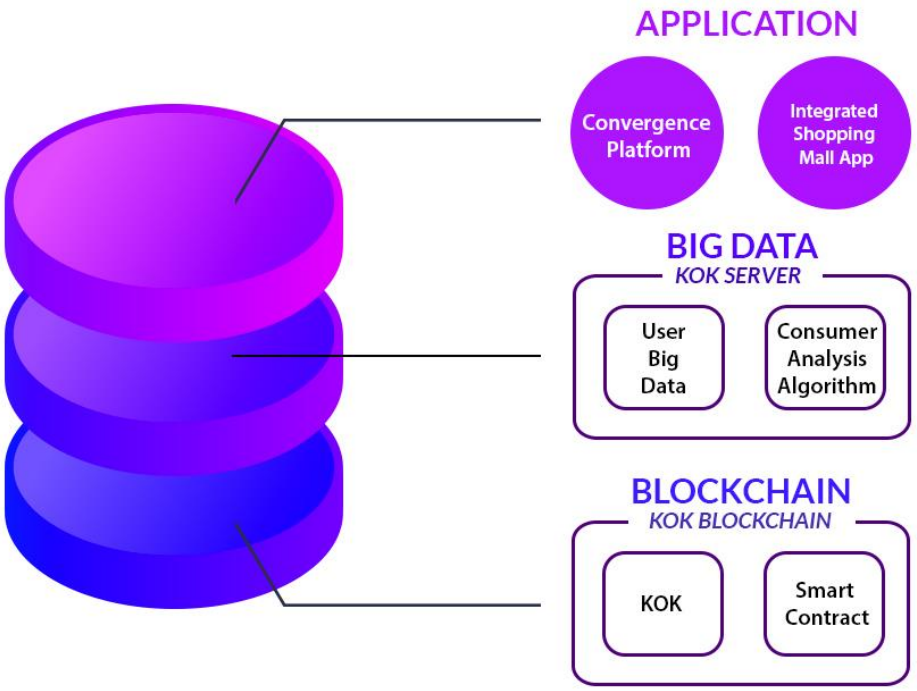


In order to expand the ecosystem of KOK Platform and improve services, the representative nodes within the KOK will select a majority of brands that can provide goods and services to the KOK shopping platform. Validated brands promise quality assurance for goods sold and record transactions (TXs) that are made based on the hash value, leaving them in database log. A purchaser with proof of a transaction may request a warranty for quality based on the transaction, and does not guarantee quality in the case of a third party without a transaction.

Store & Utilize Consumers' Big Data

Personal information set by consumers according to data delivery, search data by consumers, data related to consumer consumption patterns are integrated and uploaded to user big data servers on KOK Platform. Consumption data of users uploaded to big data servers are accumulated and based on the formation of user big data in the ecosystem, serving as valuable information in analyzing and understanding patterns of online shopping activities.

Consumers within KOK Platform will receive certain rewards as providing information to consumers in KOK Platform ecosystem is an act that contributes to the formation of the value of KOK Platform. Consumers can receive customized data based on data provided on the contrary, rather than unilaterally providing data to shopping malls and certain brands.



Consumer (user) Rewards

In online shopping, consumer data is utilized in a variety of ways. Consumers can be compensated for KOK Tokens while providing the data to the KOK shopping mall or brand. In addition, when you receive custom ads, you can receive a KOK Token as a reward.

Brands within the KOK shopping mall can receive data on target customers by purchasing KOK Tokens in the market and paying them to KOK Platform and consumers. Based on this information, KOK Token is paid to the platform to effectively proceed with targeted advertising.

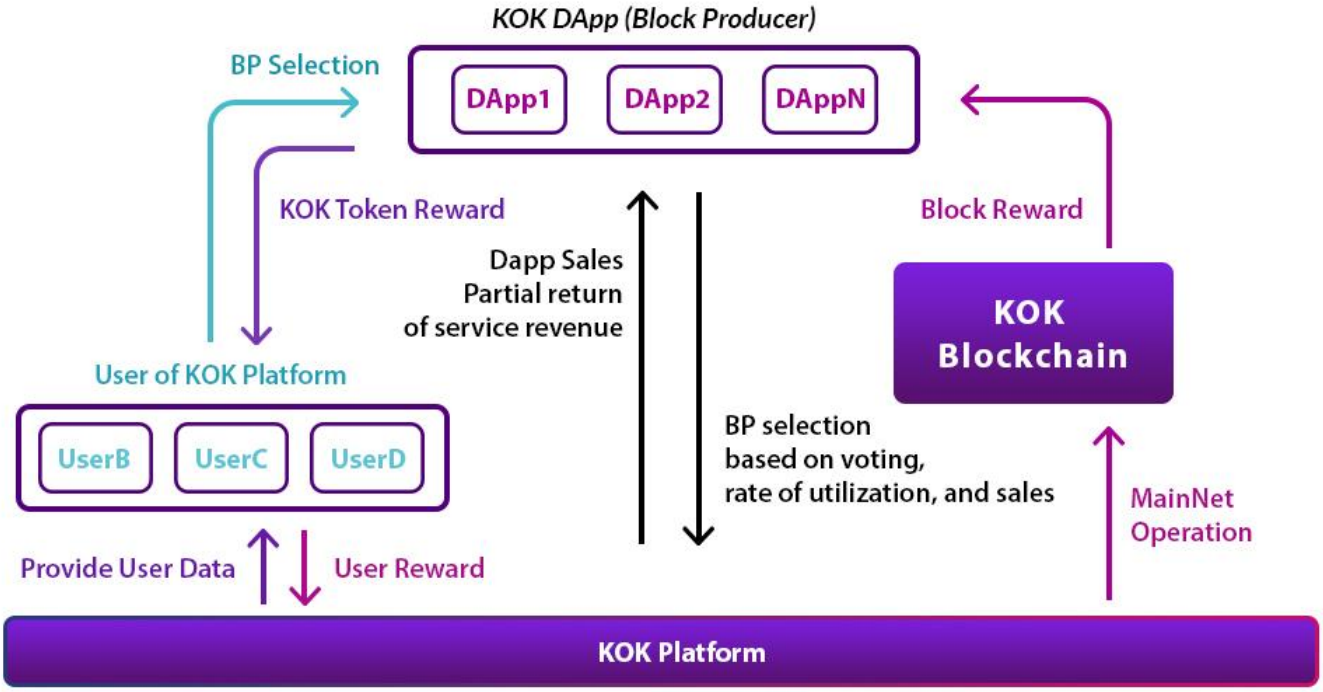
While collecting data, the KOK shopping mall rewards KOK Token and provides the data to the brand inside the KOK shopping mall. In addition, it will be paid with a KOK Token while running targeted ads, contributing to the value of KOK Token.

3.2. KOK Mining Method

The "Delegated Proof of Stake & Service(DPoSS)" pursued by KOK MainNet solves the problems of the existing PoS method and DPoS. The simple PoS method has a low return on individuals and the PoS-based master node method of mining has the disadvantage of requiring individuals to have a considerable number of tokens to form nodes. Also, simple DPoS now has a governance problem called 'collusion'. It has been criticized as a governance issue, where most of the profits could go to a handful of interest groups that collude and create nodes.

On 'DPoSS', BP is selected from DApps that provides quality services. BP selection depends on the existing voting method and the degree of service activation in the DApp, using the following measurement methods:

1. Vote
2. DApp Usage Rate
3. DApp Sales



The selection of BP gets ranked and determined accordingly to KOK Token holders' 'votes', 'DApp usage rate', and 'DApp sales'. Since the selected BP can be compensated for block creation and additional profits are generated based on the popularity of the service, DApps will try to win votes from KOK users. By measuring service usage as well as voting, DPoS's problem of conflict is effectively solved.

KOK blockchain solves the problem of the existing master node method. The BP selected by KOK Token holders will serve as the master node, and the token is delegated to the master node that voted for. The master node will receive block compensation over time according to its shares and will be distributed proportionately to the percentage of votes cast to voters.

In addition, KOK Platform provides additional compensation. KOK Platform provides additional rewards for token holders delegated to the master node. Some of the profits generated within KOK Platform are returned to KOK Platform, and the reduced amount is measured in proportion to sales to compensate the users who delegated the token. KOK Token holders mine KOK Token in various ways while using KOK Platform.





Evolution of KOK Platform

4.1. Roadmap

The KOK ecosystem has the form of improving existing digital content business models to the form of DApp and transferring them over blockchain.

Evolution of KOK Platform

Milestone 1 : (October 2019)

Issue ERC Type of KOK Token
And start mining
Launch games : Magia and Hotel King

Milestone 2 : (December 2019)

Listing KOK Token on the exchanges
Open KOK shopping Platform (B2C)

Milestone 3 : (March 2020)

Add game and culture contents on KOK Platform
Major Upgrade

Milestone 4 : (Q1, 2021)

KOK DApp IDE
(Integrated Development Environment)
and KDDK design, MVP Complete

Milestone 5 : (Q1, 2022)

Design KOK DApp Development

Milestone 6 : (Q4, 2022)

KDDK
Alpha version

Milestone 7 : (Q2, 2023)

KOK TestNet
KOK NFT function design

4.2. Governance

Issue

If governance does not operate properly to maintain the DApp ecosystem of the blockchain, the healthy ecosystem will eventually collapse due to the occurrence of collusion, which causes an unfair compensation system.

Summary

Governance must be enabled in the form of an algorithm in order to guarantee a fair opportunity for the KOK Ecosystem and to share the values, which created in a virtuous cycle within the ecosystem, to all participants in the ecosystem. KOK Platform has three axes to maintain balanced governance. There are the decision-making structure, compensation systems, and issuance of an algorithm key currency.

1. Decision-making structure- Determines the evolution direction of the KOK Ecosystem by itself.
a. Platform Policy
b. Change of Code Base and Engineering
c. Operation of BP or Master Node

2. Compensation systems – Solves the paradox of 'the tragedy of the commons.'
a. Incentive System
b. Penalty System

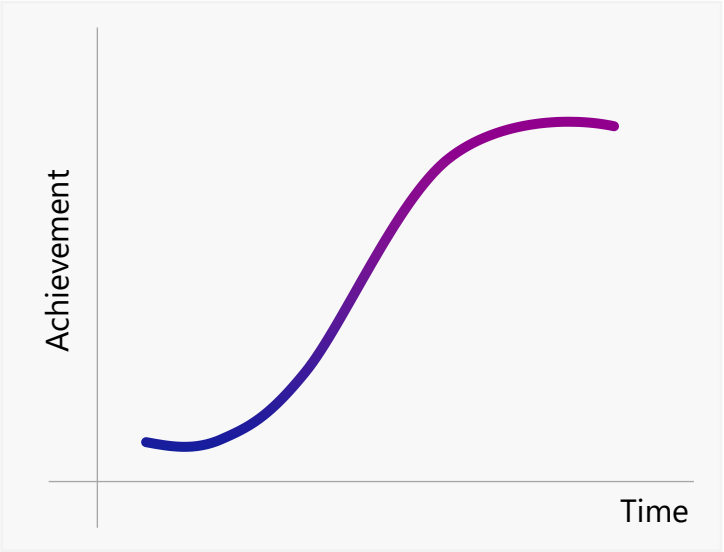
3. Issuance of KOK key currency- The token in MainNet and also the initial ERC 20 type token maintain transparent and algorithmic management of circulating volume according to the KOK key currency characteristic curve.

Governance Participation Reward

Core participants in KOK Platform governance are BP nodes representing each DApps. Sufficient rewards must be provided to these BPs to maintain the KOK Platform network healthy. The form of reward is as follows.

4.3. KOK Token Economy

To understand the whole features of the KOK Token economy, we need to acknowledge KOK is a platform as well as an ecosystem. The ecosystem is something alive, which follows the S curve in the growth pattern.

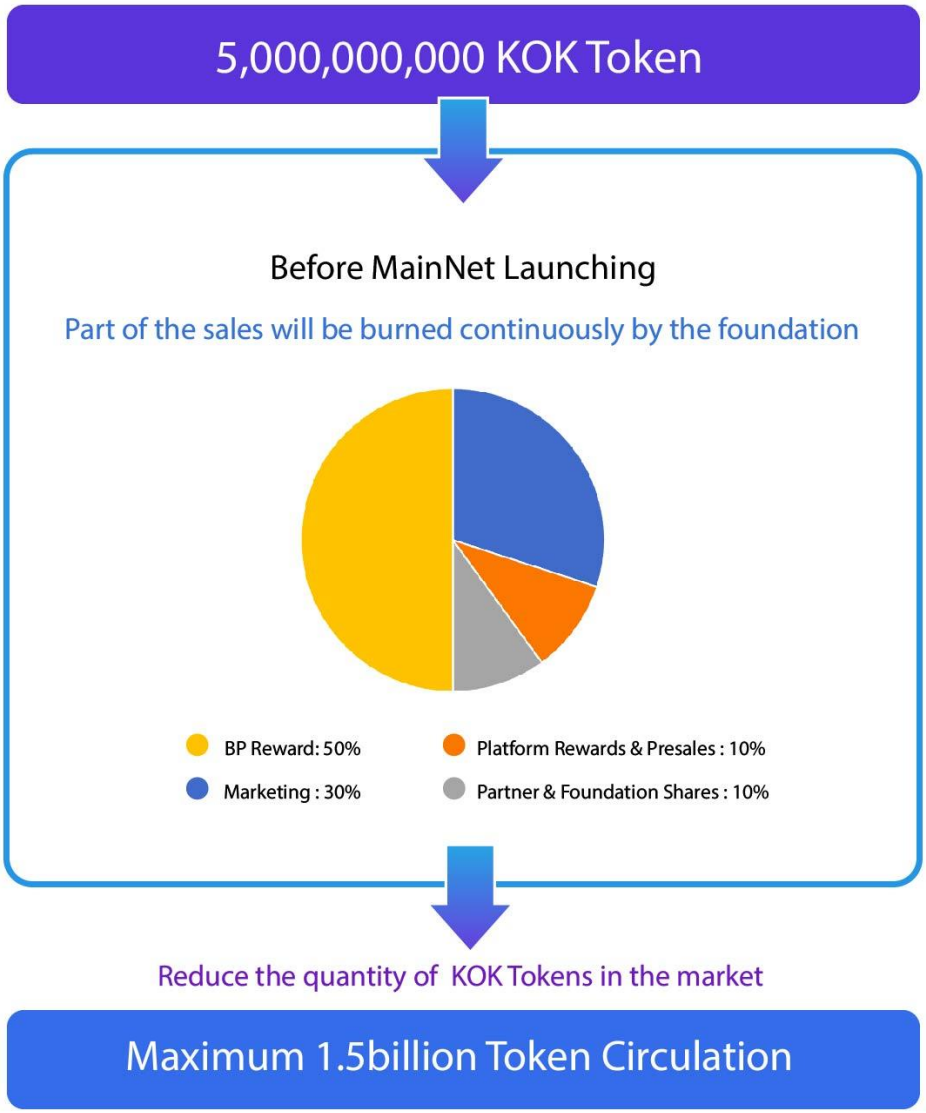


KOK Platform has an ecosystem nature but also has platform features as well. The platform has the characteristics of exponential growth, but such exponential growth causes a monopoly. A winner takes all!

For instance, a huge company such as Google and Apple, they also try to behave like a platform and grow exponentially. The object of the KOK Platform is to construct a fair and sharing platform enabled by blockchain and AI technology with participants.

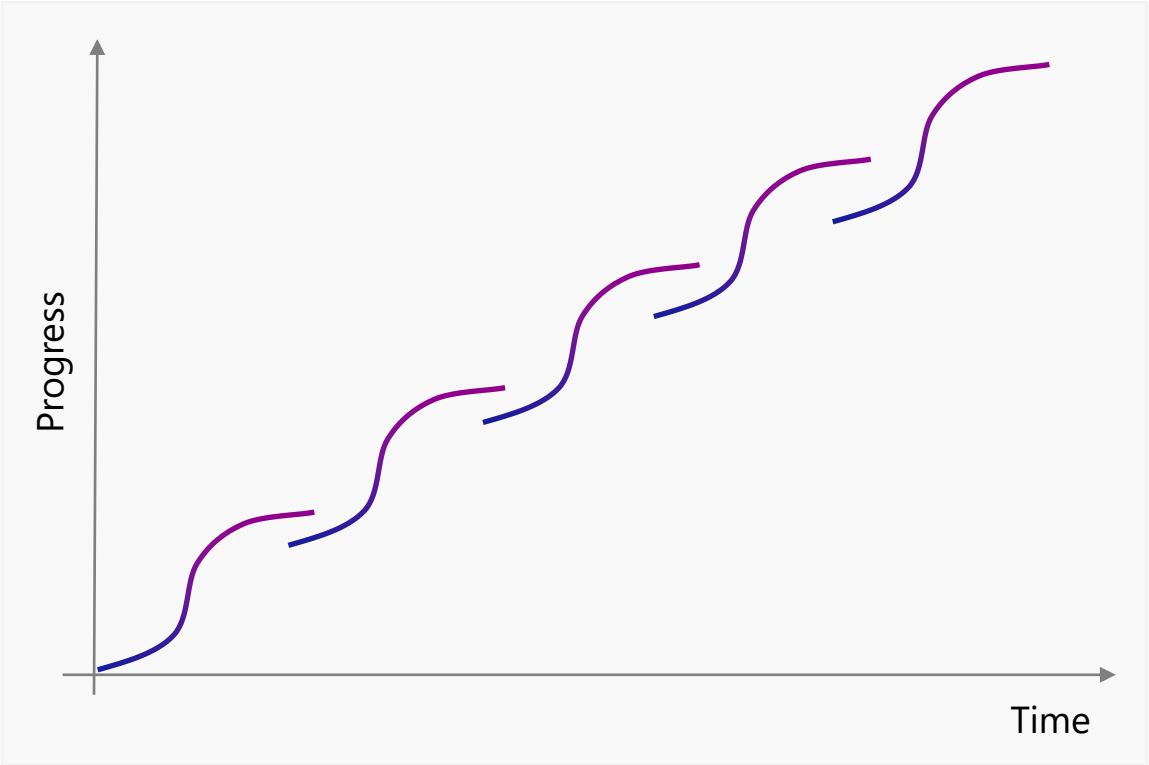
It is a very important concept and philosophy for the KOK Platform to become a fair and sharing platform with all stakeholders. In short, such exponential growth is unnatural. It can explode as the resource is limited, causing death eventually. A healthy system cannot grow exponentially. KOK Platform pursues to construct a healthy and sustainable ecosystem that grows organically. Therefore, we need to adjust the exponential growth characteristic to a stable, sustainable, healthy, and fair mechanism.

4.4. Token Issuance



4.4.1. KOK Token Issuance

As previously mentioned, the growth demonstrates these S patterns. Therefore, an ecosystem can be represented as a big summation of many S curves. We called this ecosystem's growth characteristics curve.



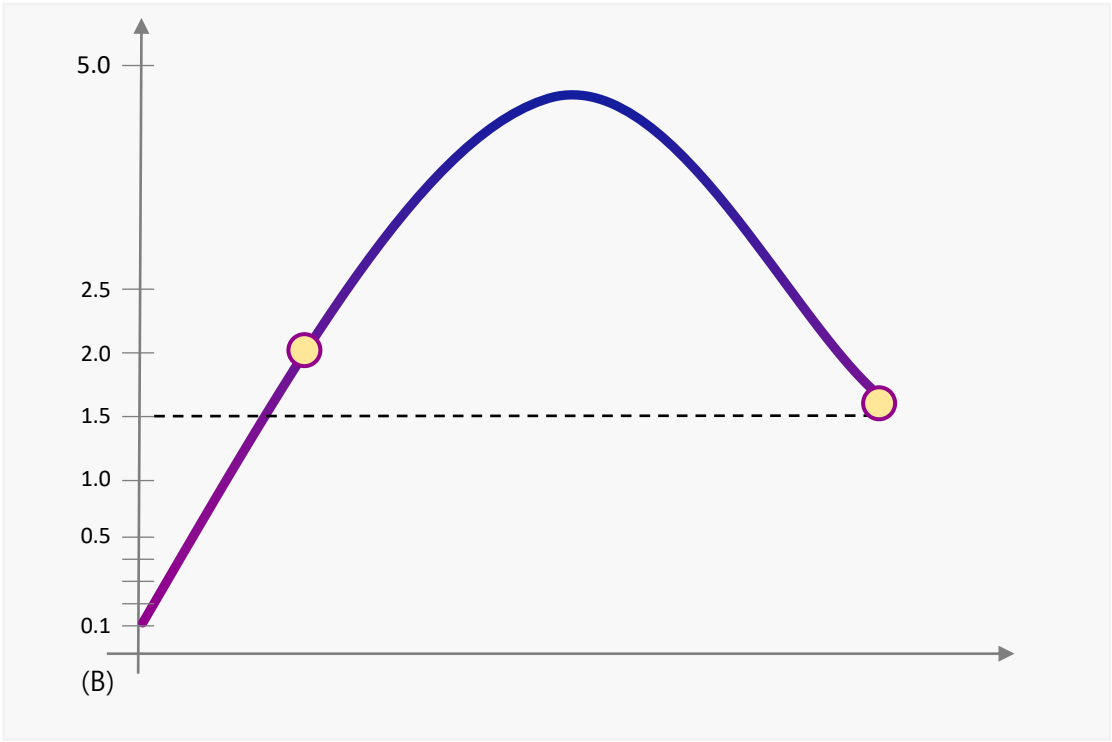
By considering many business operational reasons and vision of KOK, the platform sets the growth characteristics curve to grow rapidly at the beginning then to converge to a certain equilibrium.

The diverse characteristics curve of KOK can exist, but the graph is demonstrated in terms of the circulation of KOK Tokens. There are many ways to represent the vision of KOK or growth. However, we fitted our characteristic curve in terms of circulating KOK Token. The theoretical maximum amount of KOK Token is 5 billion.

KOK Platform is designed to grow and expand quickly with more participants within the platform. We have set the amount of circulating KOK Tokens to follow this characteristics curve and reduce the quantity after the expansion. It is then converged to a specific number of 1.5 billion KOK Token.

All formulas inside the KOK Token Economy are set according to this characteristic curve, considering the behavior of participants including mining of KOK Token, expanding user basis, and KOK platform price.

Characteristics curve



There are two knobs that control our KOK Platform price –mining rate and burning. The mining rate controls the issuance of KOK on the platform. The Burning directly reduces the circulation volume of KOK Token.

Without the mining rate adjustment, the circulation volume of KOK Token will grow exponentially. It can be explained with an exponential function of time “t” with the coefficient "r." The mining rate is indicated as "r" and time is indicated as "t." "r" is more like an approximated rate, a scalar mining rate. The mining rate(Vector) varies depending on the mining amount. Therefore, we approximate the different mining rates into one variable. The bigger value of "r" shows the steeper exponential curve.

On the contrary, the smaller value of "r" shows the gentler exponential curve. We will adjust the value of "r" to make the actual circulating amount of KOK Token close to the characteristic curve. The value of "r" is calculated by the total amount of mining, the number of participants, the cumulative mining amount, and the consumption amount. When the ecosystem is activated and the mining amount is above the characteristic curve, the value of "r" will be reduced. On the other hand, when there is a limit to liquidity supply due to the slow expansion, the value of "r" will be increased to facilitate the circulation of KOK Tokens. This mining rate is the first knob to adjust the circulating volume of KOK Token.

It is operated by the following equation obtained using the MinMax algorithm and mathematical simulation, which is also called the Alpha-Beta Pruning algorithm. This algorithm helps to get the platform price with S_min and S_max. "m" is the total accumulated number of KOK Tokens. "t" represents the staked amount of KOK Token and "r" indicates the mining rate. The combined formula which is multiplied in terms of a vector is as follows.

$$m = \sum_{x}^{\alpha} \sum_{y}^{\beta} (t_{xy} \cdot r_{xy})$$

F is the basis function to reflect all the nature and parameters of the recommender. Generally, it is marked as vector.

$$S_{\mathbf{min}} = \min\left(\sum_{x}^{\alpha} \sum_{y}^{\beta} (m \cdot F_{xy}) \right)$$

$$S_{Max} = Max\left(\sum_{x}^{\alpha} \sum_{y}^{\beta} (m \cdot F_{xy}) \right)$$

S_min is the minimum average price, and S_max is the maximum average price of KOK platform. Platform price is decided as an outcome of zeta function with min and max. This equation helps to decide two values. This formula firstly decides the platform price and secondly determines the mining rate. The whole goal is to follow the fit circulation characteristic curve closely by the appropriate setting of the mining rate and KOK Platform price.

The platform price determined through this calculation process serves as a safeguard for the market price and contributes to the expansion of the platform ecosystem. If the price of KOK traded on the exchange is lower than the price of the platform, people will try to buy KOK Token from the exchange and move it to the platform. This will naturally lead to a buying demand, which will raise the market prices. Conversely, if the market price of KOK Token is higher than the platform price, mining and platform participants will eventually increase, which will further expand the platform ecosystem. This leads to a rise in the platform prices in the long-term.

This adjustment of the total circulating amount of KOK Token is to ensure the better KOK price performance by preventing the explosion of the circulating amount of KOK Tokens.

The second knob, called burning, has a direct and immediate effect on KOK Token's circulation volume control.

As previously explained, the amount of mining can grow exponentially. Even though we set the value of "r" and "p," there could be some gap, a divergence from the characteristics curve. Then we have to adjust the total circulation volume. That adjustment is our second knob, burning. Burning is applied to adjust the circulation volume of a certain point close to the original characteristics curve at that moment. There are two schemes of burning – periodic and institutional.

- Periodic Burning

If KOK Tokens are consumed to purchase items, goods, and services on the platform, those tokens are subject to the burning. If KOK Tokens are consumed to exchange to other cryptocurrencies for withdrawal, those tokens are also reserved to be burned. This type of burning is periodic burning that burns consumed KOK Token to a certain rate at the end of the cycle. The burning ratio is determined by the KOK Foundation to converge the circulation volume after the burning closely to the characteristic curve at that time. The ratio will be lower than 100%.

- Institutional Burning

If the periodic burning is not enough, we need to adjust manually. Institutional burning by KOK Foundation will take place when more burning is still necessary. Periodic burning is decided by the money equation of KOK Token. Periodic burning is obvious to understand but the institutional burning is rather complicated as the burning formula below.

$$b_k = \sum_k^{S_n} \left(10000000 * \frac{(2n+9)}{10} \right)$$

We use this burning equation to determine the amount of institutional burning. If periodic burning is enough to converge to the characteristics curve, institutional burning is unnecessary.

The fundamental reason behind this complicated equation and adjustment effort is to share the benefits generated from the platform with participants, especially with the early participant to build the KOK Platform.

4.4.2. KOK Token Swap

KOK Token that initially issued in the form of ERC20 will be swapped 1:1 with 1.5 billion tokens according to the circulating volume at the estimated point when the Mainnet of the KOK platform and key coin of the KOK ecosystem are prepared.

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