



FUTUREPIA

Futurepia
Built and Owned by Users

WHITE PAPER Ver. 1.3
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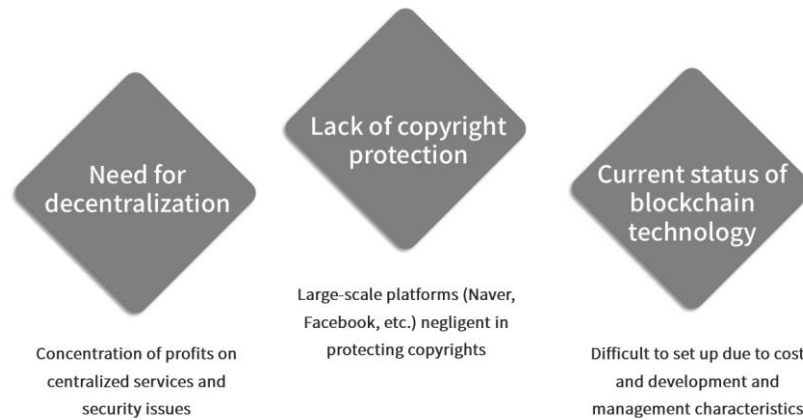
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1. Motivation for Planning and Development

1-1 Problems with the Existing Online Ecosystem



< Fig. 1. Problems with the Existing Online Ecosystem >

Google and Facebook are arguably the world's biggest tech companies today, with the imminent advent of the Fourth Industrial Revolution. The primary source of income for these two companies is advertising. The amount of sales generated via ads depends on user traffic, rather than the quality of the ad content, and user traffic is garnered by users themselves who post content that appeals to other users. Proper compensation for these individual users, let alone basic copyright protection, is not happening. In fact, users are encouraged to share their content for free and they have become accustomed to this practice. Google and Facebook are also using their power and influence to deal with the conventional major media companies as follows:

There is growing dissonance between American newspaper companies and Internet service providers. The News Media Alliance (NMA), to which around 2,000 newspapers in the United States and Canada have subscribed, declared its intent to collectively negotiate the online advertising fees and the matters related to user data with Google, the world's biggest search engine, and Facebook, a social networking site. The reason behind the clash is that the online advertising market is currently dominated by these two industry giants.

While the online advertising market has grown substantially over the years, most of the profits are going to the two companies. At the annual general assembly of NMA held in early May this year, the ways of attracting readers and advertisers in the digital age were discussed, and the parties had no choice but to acknowledge the fact that they had to rely on Google and Facebook to reach larger audiences. In recent years, the online ad market has become increasingly dominated by Google and Facebook. The two companies, together, have more than half the share of the online ad market, and more than 70% of the profits from the growth of the online ad market will go into their pockets.

Apple and Amazon are also trying to get into the online advertising business, but they are far behind the top two industry leaders. Newspaper companies, on the other hand, want to distribute their articles online in order to generate profits from ads and collect personal data with which they want to boost readership. However, Google and Facebook occupy the contact points between newspapers and readers, and newspaper companies have no choice but to accede to the advertising fees and personal data provision conditions proposed by the two tech giants.

This past July, NMA requested U.S. Congress to allow collective negotiations with Google and Facebook. In the past, news outlets have been negotiating individually with Google and Facebook on advertising fees, and they are now seeking collective bargaining power. This, however, is in violation of the antitrust laws of the U.S., which prohibit monopolies. For their cause, NMA argued that "In the digital age, if media companies cannot collectively negotiate with the platforms (i.e. Google and Facebook) with a monopoly over the contact points between readers and advertisers, high-quality journalism cannot be maintained," thereby demanding Congress to make an exception to the rule against monopolies. If Congress does indeed permit NMA to make collective efforts in negotiations, the organization plans to demand an increase in the fees for ads shown with the articles posted, protection of intellectual properties, and provision of personal data.

At present, Google and Facebook are legally protected in the online news transmission process. This is because the target of lawsuits for defamation and violation of privacy has been restricted to newspaper companies publishing the articles. The two companies bear no responsibilities in relation to the content of the news provided via their platforms. However, if the conflict between NMA and Google and Facebook becomes further aggravated, it is highly likely that NMA will raise its voice regarding this inconsistency in the law.

According to an article recently published online by JoongAng Ilbo, one of the major newspapers in Korea, protection of the rights to the personal content created by the users, who serve as the very foundation for generating massive advertising income, is not being discussed.

Amidst these trends, the blockchain technology, the public awareness of which has grown due to the cryptocurrency like Bitcoin, is fast emerging as a solution that is giving people great hope and expectations. Although it is still in its early stages, it is forecasting changes in the way profits are generated from content. In the case of Steemit and Akasha, they are presenting a new way of making profits from personal content in which the readers get directly involved in the process of compensating the content creators for their content. In the past, information producers were not directly compensated by advertisers, and instead, it was the platform providers, serving as the middleman, that took huge chunks of the income from advertising. Although content creators are compensated according to the quality of their content, as is the case with webtoons, it is mostly the advertising income determined by user traffic that makes up a big part of the income structure. Most content creators thus focus more on increasing the traffic to their content, rather than the fundamental value of their content, in order to make more money from advertising. As a result, there is greater importance placed on traffic, rather than the essence of the content, and content creators are intent on creating the kinds of content that will likely receive high traffic and thus attract more ads. It would not be an exaggeration to say that the producers of fake news are parasites that are feeding off this trend.

Blockchain-based content services are somewhat similar to the existing services such as social networking sites like Facebook and blogs, but they offer a completely different kind of compensation system. Content creators are rewarded based on the number of votes they receive for their content, without any middleman involved, and this is presenting a new way of generating profit from personal content. That is, content posters are compensated based on the number of votes they receive from the readers, instead of from the traffic-dependent advertising fees. Therefore, content creators can better focus on raising the quality of their content, instead of attracting advertisers, because they are more likely to receive a higher pay if they post quality content.

Thanks to blockchain, the method of protecting the copyright of personal content is also changing. Blockchain can effectively protect original works against indiscriminate reproduction and distribution. The Internet is a medium that facilitates information distribution, but at the same time, the ease of sharing information and content threatens the rights of content providers. On the current content (images, videos, written posts, etc.) distribution platforms such as Facebook, Instagram and blogging sites, it is possible to illegally copy and share the posted content without the consent of the original creator. After countless rounds of copying and sharing, it becomes highly complicated to find the original copy of the material, and this renders it more difficult for the producers of the original works to have their copyrights protected.

In the case of blockchain-based content services, the original content producer or author retains the data on disclosure records, which prove the content source, and this in turn promotes copyright protection. Because all the data are connected in a blockchain for storage, it is impossible to forge or tamper with the data. When someone uses or copies the data, the records of this action get stored in the blockchain, making it easy to trace back to the original copy. For litigations regarding copyright violation, blockchain-based records can serve as evidence that certain users used or shared the content at a certain time. In other words, blockchain makes it easy to ascertain the ownership of the content in question, and this is expected to promote the protection of the rights of content providers. We will now live in an era when all users, without any exception, can make sure that their personal content are respected and also make money from their content. We believe that this is what the Fourth Industrial Revolution must be founded upon.

1-2 Problems with the Existing Blockchain Ecosystem

Ultimately, countless decentralized applications (DApps) based on personal content will emerge, and we present to you a solution that can resolve the issues of the blockchain industry to better prepare for what is ahead.

Bitcoin, Ethereum and EOS are all examples of a mainnet. Recently, thousands of blockchain startups were founded, and most of them are endeavoring to provide services based on a mainnet. CyprotKitties and Akasha use the Ethereum mainnet, for instance. However, Ethereum-based blockchain services are facing extremely slow processing speeds making it nearly impossible to provide actual services (the processing speed of Ethereum is 20 TPS, as of September 6, 2018), and following a successful initial coin offering (ICO), all of the companies that chose Ethereum are now being forced to choose a new mainnet. On top of that, with respect to Ethereum, users must pay a so-called "gas fee" for every transaction, no matter how small the amount. In addition to the financial burden, users signing up for CryptoKitties, for instance, must additionally obtain Ethereum to use its services.

Under these circumstances, the mainnet that is emerging as the "Ethereum killer" is EOS. EOS has reached No. 1 in terms of transaction amount on the cryptocurrency exchange in Korea, but it also has its own issues, as follows. In the early stages, DApp developers must invest around KRW 2 to 3 billion to secure a network, CPU and memory capacity they need before they can provide services on the EOS mainnet. This is an unfavorable condition for new startups compared with the conventional startup ecosystem. Also, 21 masternodes are chosen in order to boost the processing speed, which is efficient, but the downside is that because all of these 21 masternodes are exposed, they become vulnerable to network attacks. Another problem is that the participation rate of EOS coin holders for electing masternodes is only around 20%, indicating that a truly representative democracy is not being realized.



Ethereum

PoW

- Significant burden arising from the gas fees for inter-user money transfer
- Difficult to commercialize due to slow TPS



EOS

DPOS

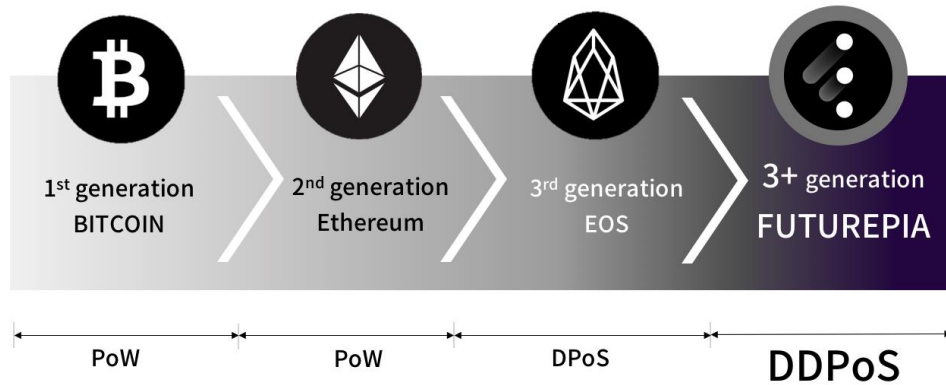
- High initial costs: DApp developers must purchase 2-3 million coins initially
- 21 BPs are exposed, leaving the network vulnerable to attacks
- Non-exercise of voting right by individuals and abuse of voting rights by the exchange
- Low BP voting rate (less than 20% of the coin holders)

< Fig. 2. Problems with the Existing Blockchain Mainnet

1-3 Evolution of Blockchain Technology

The Futurepia mainnet is a 3G+ mainnet, an upgraded version of the third generation (3G) mainnet, developed by addressing the problems of EOS, a 3G mainnet. Bitcoin, a first generation mainnet, was the most famous, having marked the beginning of the blockchain era, but it has limitations in that it can only record Bitcoin transactions in the blockchain. On the other hand, Ethereum added a smart contract feature, thereby allowing all other data, aside from coin transactions, to be recorded in the blockchain. This became the impetus for expanding the scope of application to include various other markets, and it in turn led to the development of diverse coin models and an increase in ICOs. Ethereum, however, has disadvantages in terms of processing speed and gas fees, and this is why there aren't that many DApps that are based on Ethereum. EOS has addressed the existing problems, but based on what has been revealed so far, it is also showing problems in terms of block generation and processing and the processing speed is actually slower than 100,000 TPS, which is what it has originally claimed.

The mainnets that have emerged to date offer their users to use the blockchain technology and they aim to provide stable services. Nevertheless, they fell short of expectations in relation to the DApps operated on them and from the user perspective. In comparison, Futurepia is not only technically superior, but also offers conveniences to its users. Detailed explanations will be provided in chapters 2 and 3 in this White Paper.



< Fig. 3. Evolution of Blockchain Technology >

2. Futurepia Mainnet

2-1 Algorithm for Block Generation (DDPoS)

The way in which blocks are generated on Bitcoin or Ethereum is the proof-of-work (PoW) method. A block header gets generated as the nonce value is changed by a hash algorithm through GPU, and a block is generated whenever the hash value of the block header is smaller than the proposed bits value. This requires costly equipment with high computing power and the cost is significantly higher in comparison with the amount of mined coins.

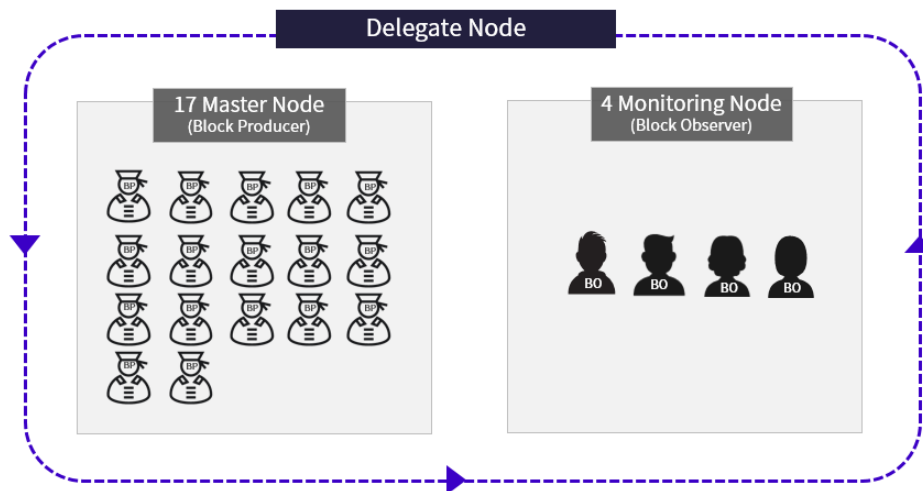
In order to reduce such cost, Qtum and various other cryptocurrency developers have come up with the proof-of-stake (PoS) method in which blocks are randomly generated and priority in this random block generation is given to the nodes with greater shares.

However, giving priority in block generation to those with greater shares hinders the popularization of blockchain. For this reason, Graphene improved the algorithm to delegated proof-of-stake (DPoS) in which masternodes are elected in the democratic way of voting for blocks to be generated in a random order in the masternodes.

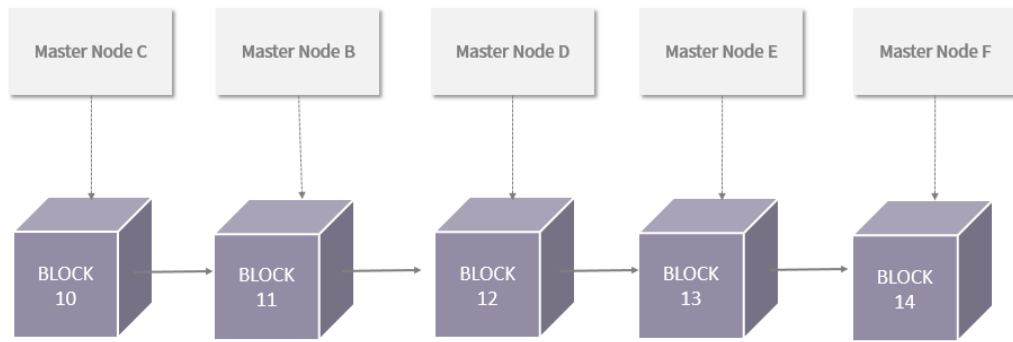
Although it addresses the disadvantages of the PoW and PoS algorithms, this method also has a drawback in that 51% of the elected masternodes will be in collusion, as there are a predetermined number of nodes, which are few.

In the dual delegated proof-of-stake (DDPoS) of Futurepia, the Futurepia nodes that are arbitrarily chosen (block observers: BOs) jointly generate blocks in a random order in order to maintain the integrity of the elected masternodes and the entire blockchain.

This method of generating blocks does not incur any costs, not even in the use of the blockchain, and even if the masternodes become in collusion, integrity can be maintained as collusion is prevented by the random nodes (BOs) that are arbitrarily selected.

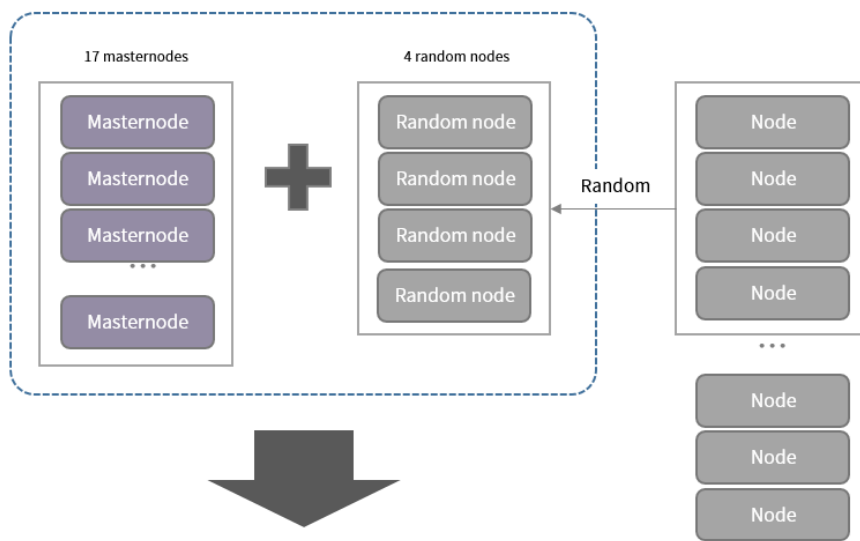


< Fig. 4. Consensus Algorithm of Futurepia >



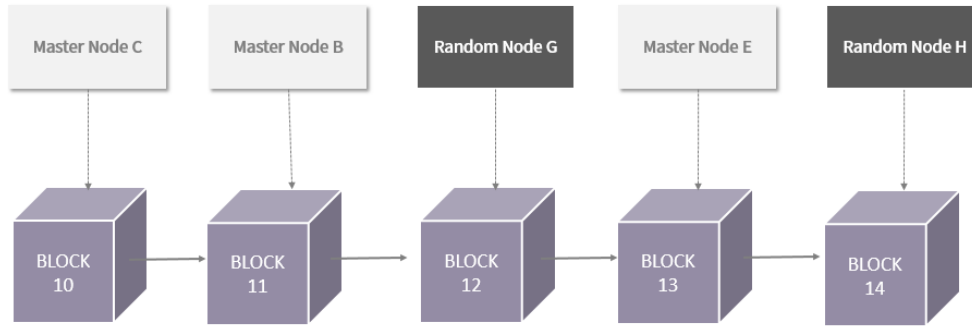
< Fig. 5. Block Generation in Graphene Engine >

<Fig. 5> shows how blocks are generally produced in the Graphene engine. The predesignated masternodes (C, B, D, E, and F) generate blocks (10, 11, 12, 13 and 14) sequentially according to the randomly determined order. Masternodes are nodes with the authority to generate blocks that make up the blockchain and they are determined by the votes of the members at certain time intervals. General nodes, on the other hand, are nodes that contain copies of the blockchain data and generally do not have the authority to generate blocks.



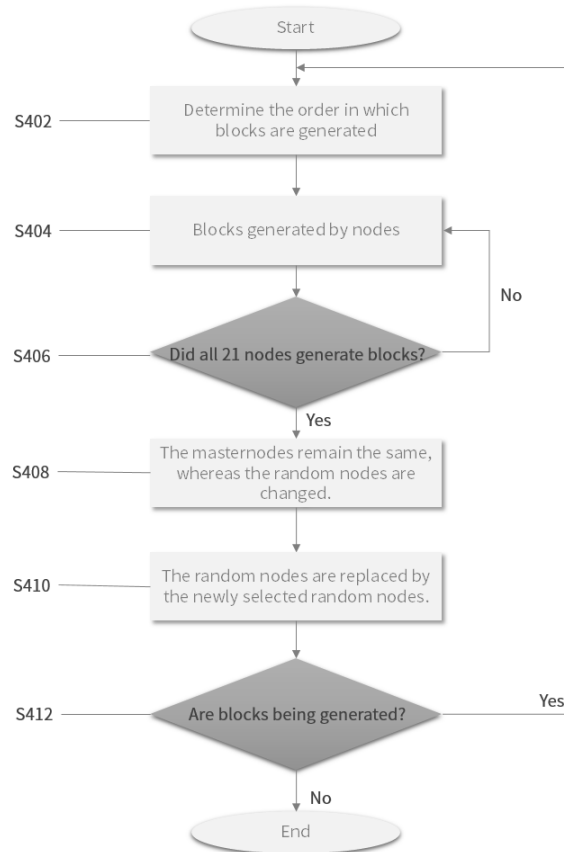
Blocks generated sequentially according to the arbitrarily determined order

< Fig. 6. DDPoS Algorithm >



<Fig. 7 Futurepia Block Generation >

<Fig. 6> and <Fig. 7> show an upgraded way of generating blocks according to the DDPoS algorithm. In this invention, a certain number of nodes (BOs) are selected randomly among the general nodes, and these nodes (BOs) generate blocks in a random order together with the masternodes (block producers: BPs).



<Fig. 8. Block Generation Flowchart>

<Fig. 8> is a flowchart showing the process of block generation based on the DDPoS algorithm. To explain, the block generation sequence of the 17 masternodes (BPs) and the 4 random nodes (BOs) are determined, after which all of the nodes begin generating blocks. Then, the masternodes (BPs) are maintained as they are, whereas new random nodes (BOs) are selected. These steps are repeated.

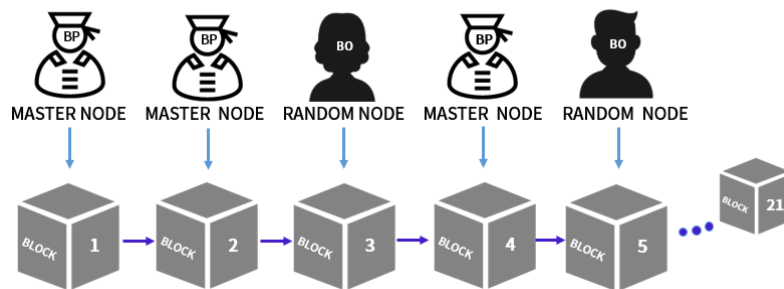
2-2 Reinforced Security of the Personal Key

Users only need to remember their respective ID and password, but on the system, they each possess an encrypted non-redundant personal key, based on their individual activities (posting messages, posting comments, transferring coins, etc.), in order to ensure the security of the DApp service and as a countermeasure against possible hacking.

2-3 Blockchain Generation

Futurepia is designed to facilitate inter-block communication. This can be obtained by generating a proof of message existence and a proof of message sequence. A block can be produced every three seconds, and blocks can be generated by up to 21 nodes. These 21 nodes consist of the elected masternodes (BPs) and randomly selected nodes (BOs) in each round (i.e. at the time of generating 21 blocks) to ensure security, and these nodes are involved in the block generation process. During the block production rounds, each node supports the validation of blocks and transactions.

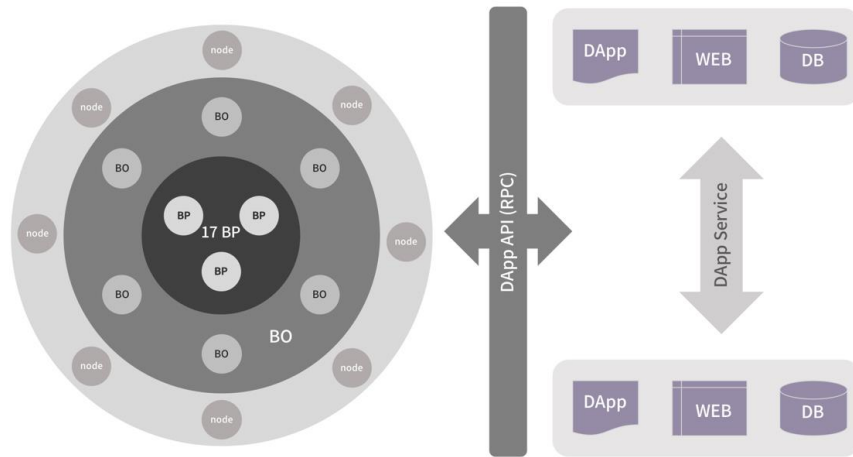
In comparison with the method of generating blocks using hash links, it has almost zero overhead, and it is possible to optimize the time and bandwidth for verifying the proof of the chain. Because there are 21 definite block producers that produce a block every 3 seconds, it takes 63 seconds to determine irreversibility.



< Fig. 9. Conceptual Diagram of Block Generation by Futurepia's DDPoS Algorithm >

2-4 Monitoring/Performance Improvement

- (1) Test node
If a function is recorded in a currently active blockchain by a user who wants to test Futurepia functions or DApp that is currently in development, there is a high risk of impacting a system that is operating well. However, when it comes to developing a new DApp or applying an upgrade, there is a need to test it out in a blockchain that is actually in operation. Our company provides test nodes that are kept separate from the blockchain services to ensure safe development.
- (2) Debug mode
As for the blockchain services that are already in operation, Futurepia offers a debug mode service that enables debugging by applying the changes in advance in case of changing the blockchain engine database to add a new function or upgrade the blockchain performance, or resolving development issues by changing the blockchain time. This allows debugging the problems in which the existing data are affected by the added codes for performance improvement or the problems resulting from a hard fork in the operating nodes.



< Fig. 10. Futurepia Blockchain System >

2-5 Differentiated Processing of SmartContract

In order to execute a smart contract on Ethereum and EOS, for example, the contract must be uploaded on the mainnet server after program coding for compile, and this kind of development process is time-consuming and complex. With Futurepia, on the other hand, the DApp developer simply has to call the API, provided by the mainnet, from its development environment, which facilitates the development process. From the perspective of DApp developers, this is a very fast and stable development environment. In the future, support will be provided for immediate execution of smart contracts using SQL commands through the database provided together with the blockchain service.

e.g. Example of API concerning tokens of DApps to be provided by Futurepia

(1) Create

The following function is called to create a token:

```
$token->create_token($required_auth, $name, $symbol_name, $publisher, $init_amount );
```

Argument Description

required_auth	Creating user's active key
Name	Token name
symbol_name	Token symbol
Publisher	Account ID of the user
init_amount	Initial amount

Transfer

The following function is called to send tokens to another user:

```
$token->transfer_token($required_auth,$from,$to,$amount,$symbol_name,$memo);
```

Argument Description

required_auth	Active key of sending user
From	Account ID of sending user
To	Account ID of receiving user
Amount	Token amount to be sent
symbol_name	Token symbol
Memo	Memo

(3) Display balance

The following function is called to check one's token balance:

```
$token->get_token_balance($account);
```

Argument description

Account	Token owner's account
---------	-----------------------

(4) Burn

This is the function that allows users to delete the tokens in their possession. The following function is called, typically by the token issuer, in order to reduce the total amount of tokens:

```
$token->burn_token($required_auth,$account,$amount,$symbol_name);
```

Argument description

required_auth	Active key of Token owner's account
Account	Token owner's account ID
Amount	Number of tokens to be erased
symbol_name	Token symbol

(5) Error handling

For example, during execution, the result is returned by the operation related to the function called.

```
$response = $token->burn_token($required_auth,$account,$amount,$symbol_name);
```

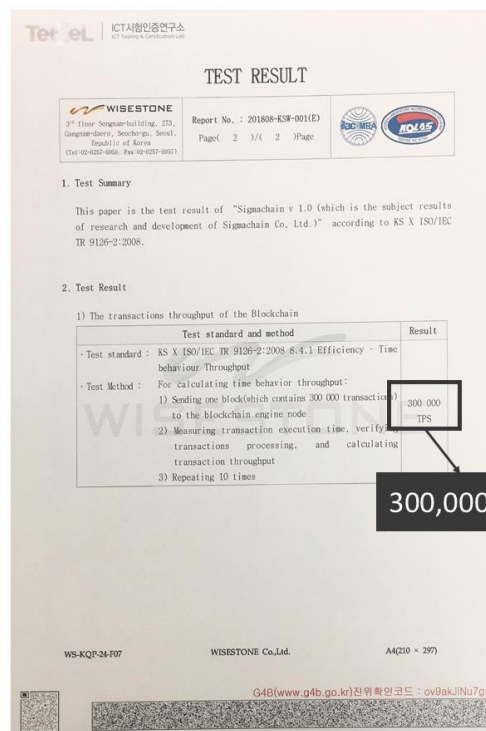
The following result value is called:

```
if($response->status == "success") // success
{
}
else // fail
{
$code = $response->result->cause->payload->error->code;
$message = $response->result->cause->payload->error->message;
}
```

2-6 Certified by the Korea Laboratory Accreditation Scheme (KOLAS)

The Futurepia mainnet (Sigmachain v 1.0) became the world's first to be certified for stable processing of 300,000 transactions per second within a blockchain by the Korea Laboratory Accreditation Scheme (KOLAS), an objective verification body.

KOLAS tests the quality of software from various fields, in accordance with the international standards ISO/IEC25022 and ISO/IEC25023, and issues a certificate of analysis on the results. The certificates of analysis issued by KOLAS are mutually recognized by 86 testing agencies in 72 countries that are signatories of the International Laboratory Accreditation Cooperation-Mutual Recognition Arrangement (ILAC-MRA) including the United States, Japan, China and EU as well as 37 testing agencies in 24 countries that are signatories of the Asia-Pacific Laboratory Accreditation Cooperation-Mutual Recognition Arrangement (APLAS-MRA), and have the same effectiveness as the certificates of analysis issued by the said certification bodies.



< Fig. 11. Copy of KOLAS Certificate of Analysis >

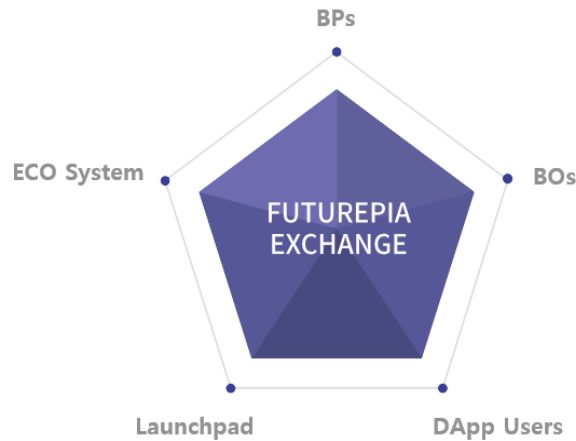
2-7 The certification of patent for DDPoS consensus algorithm

In January 2019, Futurepia received the certification of patent for DDPoS consensus algorithm.
(Patent Number: 10-1937090)



< Fig. 12. The certification of patent for DDPoS consensus algorithm >

3. Futurepia Coin System



< Fig. 13. Futurepia Coin System >

In a proof-of-work (PoW) system, blocks are generated by those who have completed the complex mathematical problems among all of the people participating in the form of direct democracy, and consensus is reached when 51% or more people agree. However, this method requires a lot of time to perform the work and to reach a consensus. In a proof-of-stake (PoS) system, it is those with greater shares that generate blocks and 51% or more people must agree to reach a consensus. In this method, there exists a risk that a person with a large share will do whatever he or she wants. Recently, EOS has been garnering attention as an alternative to boost speed and stability. EOS uses a delegated PoS (DPoS) method, where consensus is reached not by the entire group, but by the majority of those who have been elected to have the authority to vote; as such, it is comparable to the parliamentary system. Having said that, the DPoS system can have issues in the process of electing the BPs in relation to a conflict of interest, and some BPs may engage in collusion or be attacked.

Futurepia proposes a new method of reaching a consensus called the dual DPoS (DDPoS). DDPoS is similar to the consensus system of EOS when it comes to selecting certain nodes as the BPs, as the BPs are selected through a voting process. However, in order to resolve the issue of collusion or an attack against certain BPs, a block observer (BO) system, in which the BOs arbitrarily selected in each round participates in the block generation process alongside the BPs, has been introduced.

BPs are chosen by voting under the assumption that the person with the largest amount of coins suffers the biggest losses when the coin economy is in a slump and thus he/she will make decisions that select a person who will guarantee the highest reliability and stability as a BP. Those with small amounts of coins, on the other hand, may combine their voting rights in order to have the coin holder they support participate as a BP.

Unlike Ethereum, which charges a fee for every transaction, and EOS, where payment for the network, CPU and memory must be made in advance, Futurepia presents a coin economy model where its survival and the survival of DApp developers, which are the mainnet participants, are co-dependent.

In Futurepia, it is the users who own the mainnet and therefore, they are charged for small costs. DApp developers also do not need to pay any enormous fees early on, and are charged only a minimal fee to maintain the system. In fact, the coin holders of Futurepia and the ecosystem's fund can invest in excellent DApps using their coins. At the same time, the DApps are listed on the internal exchange for the PIA and DApp tokens to be traded in real time, enabling DApp developers to obtain funding more easily and guaranteeing cashability to the DApp participants.

The BPs, who equip themselves with the system and operate it in order to maintain the mainnet, are not merely issued new coins or provided with a monetary compensation; instead, they are granted the authority to judge DApps wishing to enter into the Futurepia mainnet and given the priority to invest in them under favorable conditions. In addition to the BPs, the BOs and coin holders are given the right to invest in the approved DApps. The DApp tokens value is calculated through the pricing of the internal exchange so that none of the DApp participants is placed at a disadvantageous position.

As such, the Futurepia ecosystem is designed to achieve mutual growth with the DApps.

3-1 BP (BLOCK PRODUCER)

In Futurepia, the coin holders become a block producer (BP) in the order determined by the number of votes received from those with Futurepia coins and DApp tokens. In order to be ultimately selected as a BP, the coin holder must be equipped with the system necessary for generating and maintaining blocks in a stable manner that meets the requirements of Futurepia, and deposit a certain amount of money in order to possibly compensate for damages in the future. The deposit is first used as a reimbursement, in case losses are suffered as a result of BP's fault, and returned to the BP when he/she quits, without making such faults. To ensure efficient operation of the mainnet, the BPs calculate only the coins and DApp tokens in possession for a month, and the voting process is repeated every month.

The BPs are provided with equal rewards using the network fees paid by the DApp developers based on the number of wallets they use. BPs have the priority to participate in the investment for DApp that has a good coin economy ecosystem.

3-2 BO (BLOCK OBSERVER)

In Futurepia, block observers (BOs) are designated to monitor whether the BPs are generating the blocks properly or whether there are any errors. Any coin holder can participate as a BO if he/she has a block monitoring system that meets the minimum requirements of Futurepia. All of the BOs are also provided with equal rewards from the network fees paid by the DApp developers based on the number of wallets they use.

3-3 CH (COIN HOLDER)

In Futurepia, a coin holder (CH) is someone with Futurepia coins (PIA) or DApp tokens. CHs can exercise their right of vote to the extent of the total value of the coins and DApp tokens in their possession. In case a CH votes for a BO or BP, he/she can receive some of the network fees assigned to the said BO or BP as a reward based on a certain ratio.

CHs also have the right to participate in the DApps that have been judged and approved by BPs to enter into the Futurepia ecosystem. They can participate in excellent DApps and redeem the tokens as PIAs on the internal exchange at anytime.

CHs, who want to participate indirectly because they lack the information necessary for direct participation or for any other reason, may delegate their right of participation to a certain BP. In this case, the BP that has been delegated the participation right may participate in a DApp using the delegated coins calculated based on a certain ratio.

3-4 FUTUREPIA ECO System

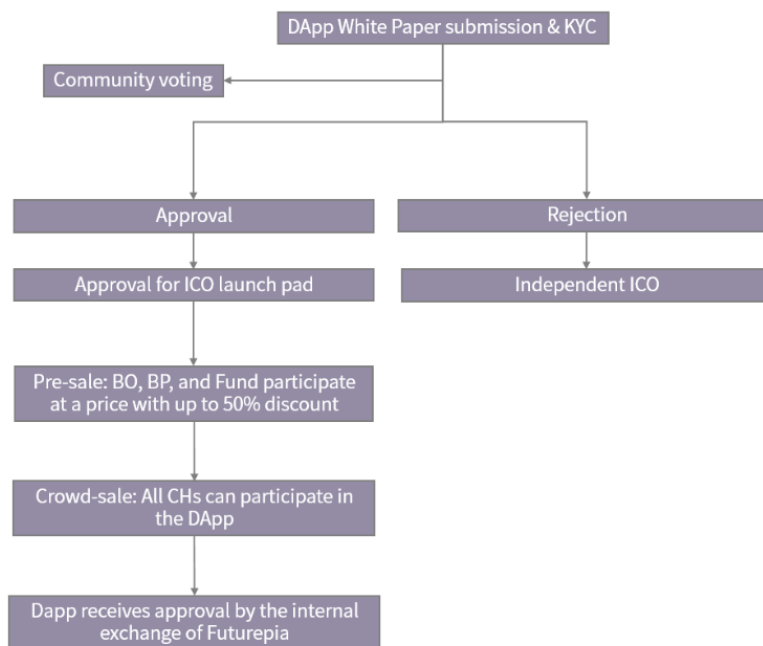
The size of the Futurepia ECO System is 6.66 billion, which is 30% of the total coins of 22.2 billion. CHs will vote for DApps in order to determine their level of popularity, based on which the BPs, BOs, and ECO System can decide whether to participate in a certain DApp at a certain discount rate in the pre-sale stage. Then, in the crowd-sale stage, the Futurepia CHs can individually participate in the DApps.

The Futurepia ECO System is used for free airdrops for Future CHs, rewards for various activities in Futurepia, and as funding for participation in the DApps.

Operating method of the Futurepia ECO System

- Futurepia will form a Participation Advisor Committee comprised of BPs to propose participation guidelines.
- Futurepia will not participate in any of the DApps in excess of 20% of the ECO System in order to ensure the sustainability of the participation activities.
- With the biggest importance placed on the interests of the entire community, Futurepia will participate in DApps that can make the most contribution to the Futurepia ECO System.
- The profits from Futurepia's participation will be accrued in the Futurepia ECO System.

3-5 DApp Selection Procedure for the Futurepia Mainnet



<Fig. 14. DApp Selection Procedure >

- A DApp developer wishing to get into Futurepia must submit its White Paper, a expected investment amount, and other information to Futurepia. Such information is stored as a smart contract, which is posted on Futurepia for a month.
- Futurepia CHs must read the said information and vote on whether to include the said DApp in the Futurepia ecosystem. DApps that have acquired a certain number of votes by the deadline are registered on the launch pad. The DApps registered on the launch pad receive coin participation from BPs, BOs and CHs and listed on the internal exchange.
- Futurepia BPs and BOs and the Futurepia Fund must read the matters regarding the coin participation and they have the option of participating at a discounted price that is up to 50% off the original price. They can participate only up to 50% of the required participation amount.
- Once this community pre-sale stage is over, the community crowd-sale stage, in which all of the CHs can participate, begins.
- Upon termination of coin participation, Futurepia launches the DApp coins on its internal exchange for trade with PIAs.

3-6 Advantages of the Futurepia Mainnet for DApps

The Futurepia mainnet is a comprehensive platform based on social networking services, in which the social network database is stored on the mainnet for all of the DApps to use it in a semi-open form. This allows DApps to gain members very quickly. The Futurepia mainnet has diverse and detailed APIs for DApp service development, allowing DApp developers to develop their services quickly at low cost. Support is also offered by the engineers of Futurepia, if necessary, and API is provided according to additional requests.

When a DApp uses the Futurepia mainnet, it means that its business model has been verified by those with Futurepia coins and will be deemed secure by external users. Also, there is a price at which it is traded, and additional coin participation can be drawn at objectively determined prices.

When a DApp joins Futurepia, the Futurepia fund and all of the members engage in coin participation following a review for approval, and it is possible for the DApp to secure the necessary funds early on.

3-7 Benefits Enjoyed by Futurepia CHs

The CHs of Futurepia have the right to participate in the DApps launched on Futurepia under favorable conditions. They can exchange the tokens from the DApp in which they are participating for PIAs or the tokens of other DApps on the internal exchange, with the cashability of the tokens ensured. The CHs can also vote for BPs and BOs using the PIAs or DApp tokens in their possession, and are given some of the rewards obtained by the BPs and BOs they've voted for. The CHs are provided airdrops, free-of-charge, as DApp tokens or PIAs from the Futurepia fund based on DApp membership registration, self-introduction on DApps and various other activities.

3-8 Voting Rights in Futurepia

In Futurepia, CHs can cast a vote on BP selection, additional issuance of coins, distribution of profits, and so on, based on the value of the assets they hold, and the "assets" that are taken into account for this purpose are the Futurepia coins and the DApp tokens, the value of which is converted in terms of PIA for the purpose of value assessment. Because of this calculation method, the PIA CHs do not see any changes in the total value of their assets at the time of coin participation in DApps. Then, later, the value of their assets is re-assessed, based on the changes in the token prices of the DApps they are participating in. When DApps achieve growth, their respective tokens will increase in price, causing changes in the asset value of the token holders, and accordingly, the order of voting among the BPs may change as a result.

3-9 Inflation Caused by Additional Coin Issuance

In Futurepia, when all of the coins in the Fund are used, a voting process for additional coin issuance is initiated, and when 51% or more of votes are in favor of the coin issuance, 10% of all coins are additionally issued to increase the amount of coins in the Fund.

In this case, the amount of coins in the Fund rises by 10% and the PIA price may drop to 90.9%(=1/1.1) of its original price at the time of participation, not at the time of issuance.

3-10 Matters Related to the PIA Price

When the Fund engages in coin participation in a DApp, the amount of PIAs sold will temporarily increase, which may in turn adversely affect the PIA price. On the other hand, when a DApp achieves growth, there will be additional funding for the DApp, which is done using PIAs, and thus the demand for the PIA will rise, making it possible for the price rally. When the services of a DApp expand, many users will need its tokens to use its services, and even in this case, the users will have to purchase PIAs and exchange them for the DApp tokens in question on the internal exchange, thereby increasing the demand for PIA.

3-11 BP AND BO SYSTEM COSTS

Disclaimer: The amount in USD may vary depending on the changes in the price of computer or memory, etc.

Node	CPU	RAM	HDD	N/W	Average monthly maintenance cost
BP	16 core	128 G	1 T	1 T	1,356 USD
BO	2 core	8 G	128 G	100 M	119 USD

The total system maintenance cost is approx. KRW 1.5 million/month for a BP and KRW 130,000/month for a BO, according to the average exchange rate in November 2018. Thus, the basic costs for maintaining the entire system if the BPs and BOs use only a single server:

e.g. 17 BPs and 100 BOs: (KRW 1.5 million X 17 BPs) + (KRW 130,000 X 100 BOs) = KRW 38.5 million/month
As the number of DApps joining the mainnet and the number of the members of the DApps increase, the cost of maintaining the system will increase.

3-12 Network Fees Charged to DApp Providers

Network fees to be paid by DApp developers (monthly cost according to the number of wallets)

- 1-10,000 wallets: KRW 1 million
- For every 10,000 additional wallets: KRW 500,000

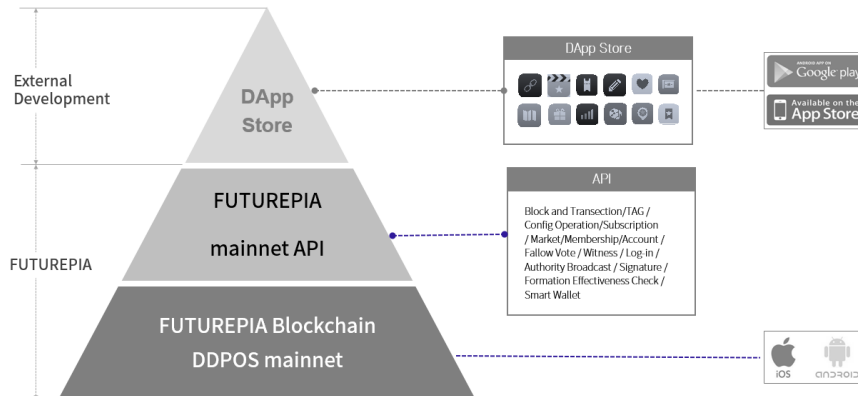
Examples of monthly network fees paid by DApp developers:

- If there are 100,000 DApp members, $9 * \text{KRW } 500,000 + \text{KRW } 1 \text{ million} = \text{KRW } 5.5 \text{ million/month}$
- If there are 1 million DApp members, $99 * \text{KRW } 500,000 + \text{KRW } 1 \text{ million} = \text{KRW } 50.5 \text{ million/month}$
- If there are 10 million DApp members, $999 * \text{KRW } 500,000 + \text{KRW } 1 \text{ million} = \text{KRW } 500.5 \text{ million/month}$

As shown, this is not much different from the conventional online business costs for DApp developers.

4. Services

4-1 Futurepia Mainnet Platform



< Fig. 15. Structural Diagram of the Futurepia Solution >

The Future mainnet services can be summarized into three layers, as follows:

- (1) The main backbone is the blockchain mainnet using the DDPoS system. A detailed explanation on DDPoS is provided in Section 2-1.
- (2) The intermediate layer is comprised of the mainnet API and the common module API. In addition to the API of the mainnet itself, the real-time video streaming, messenger, and P2P cloud service modules will be provided in API for the DApps to boost their service development speed. There are plans to allow the common modules to work a single smart contract by having them developed by other companies. In other words, the excellent DApps that enter Futurepia in the early stages will, in effect, be able to cut down the time and cost of development without bearing additional costs or sharing their profits.
- (3) The topmost layer is occupied by DApp Store, where there will mainly be DApps developed and operated by external developers. Users will be able to freely download any of the DApps they like. Votes will be cast by BPs, BOs and CHs to select the DApps that can enter DApp Store. In order to prevent stagnancy in the entire network, which is what happened recently with EOS, Futurepia will not only provide the same mainnet to multiple DApps, but also offer API for DApps that are expected to have huge traffic early on to set up an independent mainnet.

In the Futurepia mainnet, blocks are generated and verified by 17 selected BPs and 4 BOs, which are randomly selected in each round. In order to resolve the issue of low voting rate among CHs, CHs who have voted are given a share of the income of the BOs and BPs they have voted for. BPs are selected among those who meet the minimum equipment specification requirements. BOs, on the other hand, play the role of monitoring the BPs. Anyone, satisfying the minimum equipment specification requirements, can request to participate as a BO. Measures are taken so that BOs and BPs cannot be easily attacked.

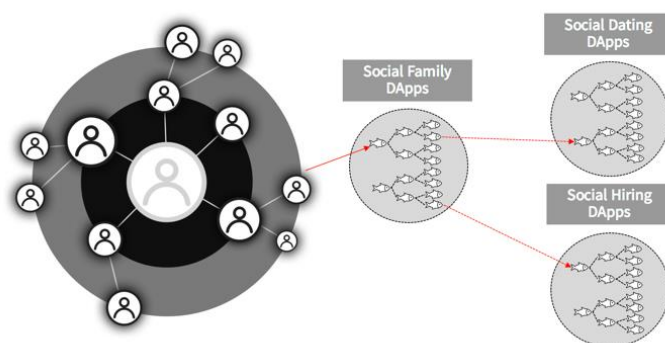
In addition, new blocks are generated in the order that was randomly determined in each round as a way to raise the efficiency of block production.

Agreements have been signed to set up independent mainnets and provide APIs to CardioCoin (awarding coins to runners through a fitness center chain), based in San Francisco, and an on/offline casino game service developers, based in LA.

4-2 Introduction of the First DApp Developed by Futurepia

DApps developed by Futurepia that can be used as a common module by the DApps of other companies will also be launched. For instance, the cryptocurrency wallet set to be developed by Futurepia will be in the form of a messenger, which may serve as a messaging API for the DApps of other companies.

The user network or the communication network database created through the messenger will be provided to the DApp developers in Futurepia so as to assist them in obtaining members more easily early on.



< Fig. 16. The World's First Communication Network API >

The Futurepia mainnet will dynamically provide the world's first social network database extending to three degrees of separation in real time. Facebook, for instance, provided the social network database of the user, his/her friends and their friends (two degrees of separation) to the external app service providers back when social games were booming. Thanks to this, a social service was launched for users to search occupations of the people within the two degrees of separation. This was also the case with a social marketplace app for selling and buying used goods. As such, countless spin-off DApps will be launched through the Futurepia mainnet, where people can search information based on their friends' and their friends' friends' activities.

Let's suppose that one DApp has 1,000 members and another DApp has 100,000 apps. A person who is a member of both DApps can create a connection between those in his or her social network in either DApp and the other DApp. This enables the DApps to acquire new members among the member's friends and also makes it easier for the member's friends to come across and sign up with the DApp they have not been a member of. FYI, LinkedIn allows its users to search for information on those with three degrees of separation, but the related data are not disclosed to external developers.

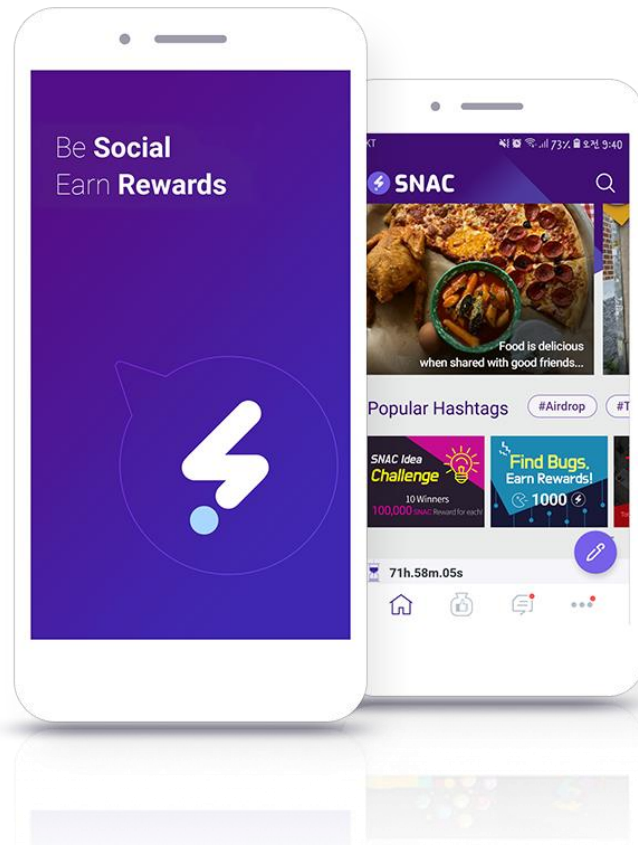
4-3 Examples of DApps Developed by Other Companies

DApps that successfully enter into the Futurepia DApp Store will be able to have their coins exchanged for PIA and vice versa on the internal exchange. This provides the DApp developers and DApp coin holders with an opportunity to create more diverse portfolios and to exchange their coins, thereby boosting the value of coin participation.

- (1) Social DApp for real-time streaming: Diverse entities are preparing to provide real-time broadcasting services using blockchain. By developing such services using Futurepia, it will be possible to offer real-time broadcasting services based on a social network with a special utility. This kind of social services for real-time streaming can be made more special through the semi-open messenger or social network browsing.
- (2) Real-time Q&A DApp: NAVER Jisik In is real-time question-and-answer site in Korea, and its American counterpart is Quora.com. Unlike these examples, however, a blockchain-based Q&A service will provide its users with rewards and it will become part of their everyday activities. This kind of DApp will be able to offer more diverse services by incorporating the semi-open messenger characteristics.

- (3) Social P2P file search: Blockchain-based hardware sharing and file trading systems such as Filecoin are gaining popularity. However, the knowledge and files with high potential for generating profits are still in dormancy, and P2P file search services are expected to provide a solution. It is expected that new horizons will be opened more efficiently by combining these services with the semi-open messenger.
- (4) Apps supporting the creation of emoticons (a.k.a. emojis) used by hundreds of millions of people are all the rage. Collective creation can be encouraged by rewarding the creators based on the extent to which they re-create an original work and their level of contribution by using the blockchain technology. DApps pursuing this type of service will also be able to maximize their market by being combined with the semi-open messenger.

4-4 SNAC Service



< Fig. 17. SNAC Sservice >

SNAC is a messenger platform based on content economy structure for those who enjoy making an impact by creating and sharing content they love.

Member's private information, along with the content, are managed securely through the blockchain technology, and each individual user in the SNAC ecosystem is compensated for creating content and sharing it with others.

A democratic economic structure is also dedicated to regular users who consume content and actively engage in activities such as 'liking', 'besting' and voting. They are compensated depending on the percentage of their activity.

SNAC has an ecosystem that pays rewards on the basis of performing various activities like creating, curating and consuming content.

- 1) Group Talk: Groups are used to form community of users having similar interests. Contents can be shared among members through in-group feeds, while opinions can be exchanged via chatting.
- 2) Messenger Coin: Two kinds of cryptocurrencies are available within SNAC. PIA itself is a utility coin that can be exchanged with KRW and other cryptocurrencies while SNAC is a compensatory coin within the messenger ecosystem. SNAC is a stable coin and unlike a volatile utility coin, it has a fixed price.

3) Reward: The original creator can earn revenue from the content he or she has created, while ordinary users also get rewards by 'liking', 'besting' and 'voting'. Depending on the percentage of their activity, the more active they are, more rewards they get.

4) Messenger Wallet: Instant Messenger Wallet feature of SNAC allows you to transfer coins directly within the app without having to open a separate wallet app. The great advantage of SNAC is that all the features that you want are available within the single app and just one click away.

5) Live Streaming: Live Streaming: Futurepia has introduced 'Live Streaming' within SNAC. Now, you can invite your friends, family members or colleagues to your 1:1 or 1:many live streaming video.

6) Market Place: Now, at anytime you can buy product of your choice using SNAC tokens that you have. This feature of using SNACs to buy various products will boost token demand in a long run.

7) P2P Distributed Cloud: By breaking the barriers between different devices to connect to each other, this feature allows transferring files between phone to PC and vice versa.

* The above services are scheduled to open sequentially.

5. Conclusion

The Futurepia mainnet offers the following advantages, as explained above:

- (1) Fast and stable transaction processing capacity that has been objectively verified
The Futurepia mainnet has been recognized for its processing speed of 300,000 TPS by a Korean certification agency (See 2-6).
- (2) A new method of reaching a consensus that prevents pollution of masternodes
We propose a new consensus system called DDPoS (See 2-1).
- (3) Diverse development support for DApps
We provide a development environment allowing immediate use of API and SQL to facilitate development (See 2-5).
- (4) Futurepia Fund and coin holders' coin participation in DApps
Excellent DApps that need funding in the early stages can draw coin participation in Futurepia (See 3-4).
- (5) Listing of DApps on the internal exchange
DApps are listed on the internal exchange, where DApp tokens and Futurepia coins (PIA) are exchanged, to ensure cashability for coin holders and to help DApp providers secure the funding they need more easily (See 3-5).
- (6) Providing a communication network solution for DApps
DApp developers are provided with the user network or communication network database, thereby assisting them in attracting members in the early stages. This presents new DApps with advantages in promoting their services and gaining new members (See 4-2).
- (7) Reward system based on the votes of coin holders
Coin holders can vote for BPs and BOs using their coins and take a portion of their profits (See 3-3).

6. Partners

The following are companies that have decided to adopt the Futurepia mainnet or operators of the mainnet nodes.

B2B Partners

Using our mainnet independently like, Lamborghini Bike and Coweye (an on-offline connected casino platform in Irvine)



- One of the first projects connecting traditional bank and the crypto universe



- JAPANESE COSMETIC COMPANY
- WILL USE OUR FUTUREPIA MAINNET INDEPENDENTLY



- IRVINE-BASED ON-OFFLINE CASINO USING BLOCKCHAIN
- WILL USE OUR FUTUREPIA MAINNET INDEPENDENTLY



- DAPP FOR AUTOMATION OF A/P THROUGH BLOCKCHAIN FOR AN EFFICIENT SCM
- WILL USE OUR FUTUREPIA MAINNET INDEPENDENTLY



- BANK SPECIALIZED APP DEVELOPER
- BLOCKCHAIN BASED PERSONAL AUTHENTICATION SERVICE



- BLOCKCHAIN BASED EDUCATIONAL PLATFORMS DEVELOPER



- N.I DOCUMENT SECURITY SOLUTION IN KOREA
- BLOCKCHAIN DOCUMENT SECURITY



- N.I MIDDLEWARE DEVELOPER IN KOREA
 - IOT / EAI / CEP
 - SMART CITY / DRONES



- CMS GLOBAL COMPANY
- BLOCKCHAIN BASED ELECTRONIC CONTRACT



- CONNECT YOUR OFFLINE STORE WITH SYRUP TABLE CUSTOMER
- THE SERVICE HAS ALREADY OVER 1 MILLION USERS



- ART CURATION COMPANY THAT ENABLES CROWD OWNERSHIP OF PAINTINGS
 - FUTUREPIA DAPP



- BLOCKCHAIN BASED CLOUD SERVICE
- CLOUD MIDDLEWARE VENDOR



- N.I OPEN DBMS
- REPLACING ORACLE IN THE BOVERMENT MARKET
- BLOCKCHAIN DISTRIBUTED NETWORK BASED DBMS



- BANK SPECIALIZED APP DEVELOPER
- BLOCKCHAIN BASED PERSONAL AUTHENTICATION SERVICE



- Donation platform
- Initiated by the medical care association



- Supplier of total solution for smart hospitals
- Adoption of private Blockchain by hospital
 - Smart hospital partnership



ASIA BLOCKCHAIN PUBLIC SERVICE ASSOCIATION

- Blockchain business and Technology R&D

DApp Developers

We have social media DApps that will be in our DApp Store, like CardioCoin (that rewards runners with cryptos for each mile they run in the Fitness Center gyms in the US).



- DAPP COMPENSATING USERS FOR RUNNING IN FITNESS CENTER GYMS ACROSS USA
- FUTUREPIA DAPP



- ART CURATION COMPANY THAT ENABLES CROWD OWNERSHIP OF PAINTINGS
- FUTUREPIA DAPP



- BEAUTY, HEALTH BLOCK CHAIN
- CONNECT THE SERVICE PROVIDERS AND CUSTOMERS THROUGH AI
- FUTUREPIA DAPP



- CONTENT REMAKE APP
- FUTUREPIA DAPP



- AI BASED REAL DOG COMMUNICATION
- FUTUREPIA DAPP



- READITJOY SOCIAL WRITING
- FUTUREPIA DAPP



- MARINE STRATEGY SIMULATION GAME
- BUILDING AN ITEM TRANSACTION SYSTEM BASED ON BLOCKCHAIN
- FUTUREPIA DAPP



- Global Entertainment Platform



- Reward system between product sales design and consumer



- A blockchain powered open source protocol

Others



- Specialized accelerator for 4th Industrial Revolution
- Venture Capital



- International Crypto Exchanges







- International Crypto Exchanges

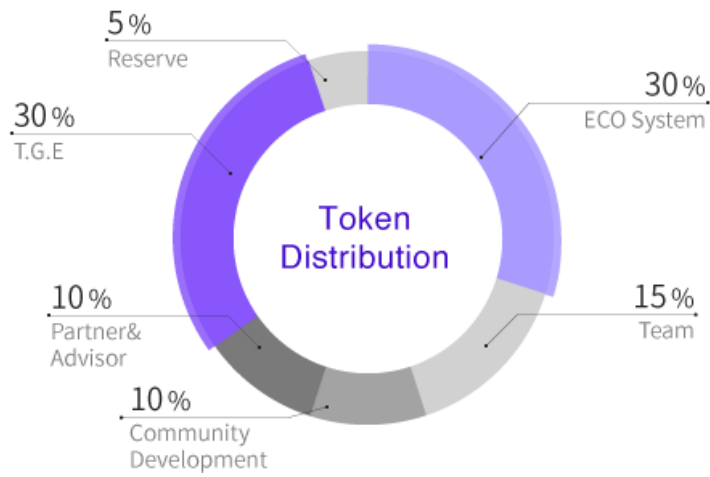


- High-End Cryptocurrency Exchange

7. Lead Members

 <p>Jinyoung Kwak CEO / CTO</p>	<p>After acquiring a master's degree in computer science at Griffith University, Jinyoung Kwak started working as a software engineer at Max Automation. Afterwards, he worked as the database administrator (DBA) for Cyworld, overseeing the database design, engineering and analysis, and then as the CTO of SayCupid. He then served as an adjunct professor of game engineering at Korea Polytechnic University. He is now regarded as a leading technical expert on database solution design/engineering, analysis, coordination and consulting. Since 2015, he has been developing technologies related to diverse services based on decentralized networks. He is the founder of Sigmachain, and is responsible for the services of Futurepia, as its CEO. In 2018, he was honored with the Blockchain Innovation Award at the Global Economic and Cultural Development Awards.</p>
 <p>Dennis Oh Vice President</p>	<p>With experience of consulting some 2,000 companies under his belt, Dennis Oh has an understanding of business models from diverse areas, and has consulted on dozens of M&A deals, leading them to success. He has contributed to the listing of two companies (Modia and Netmarble) on KOSDAQ, and previously served as a board member of Nexus Venture Capital and the CEO of a savings bank. He is armed with the expertise and experience to develop business models for horizontal and vertical expansion, based on its core value chain, and to induce its growth and further development.</p>
 <p>Jangjun Yun CMO</p>	<p>Jangjun Yun is the Chief Marketing Officer of Sigmachain, the CEO of DUBHE, and a technical advisor for the Korea Software Industry Association. In the past, he has run the Smart Technology Team at Shinhan Bank, where he has set up a blockchain-based personal information operating system. In addition, he has created an AI video evidence analysis system for the National Policy Agency of Korea and jointly established the Big Data POC Production Center with Google at LG Display. Furthermore, he has set up g-CRM/GVOCM for Hyundai and Kia.</p>
 <p>William Hugo Yang Head of Global Sales</p>	<p>William is an entrepreneur, advisor and market research analyst. He focuses on ecommerce, video games and social network systems. Prior to joining Sigmachain, William worked in Samsung Electronics, a global handset and consumer electronics manufacturer. He worked inside the 'Technology Strategy Group' and 'Global Service Partnership' team. Before joining Samsung, William founded and led Unity Technologies Korea office. In this role, he was at the forefront of rapid-growth, and he led the team to deliver 300 percent year-over-year revenue growth and launched several new SaaS products. He started his career as a financial consultant at PricewaterhouseCoopers (Samil) Accounting firm specializing in M&A and corporate finance. William received a master's degree in Political Science from Yonsei University and a bachelor's degree in Sociology from Simon Fraser University.</p>

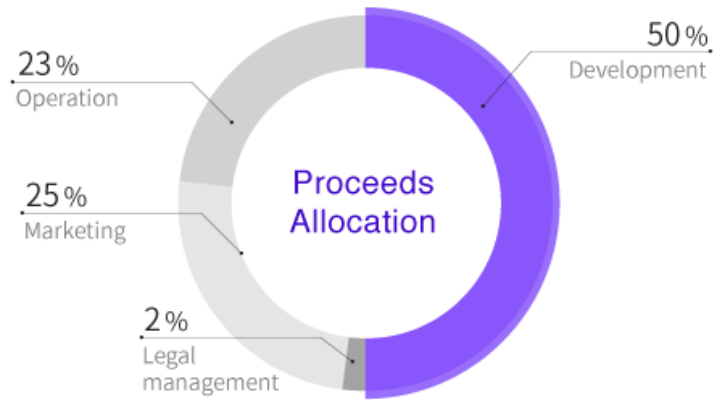
8. Token Distribution Structure



<Fig. 16. Token Distribution Ratios>

total number of coins in Futurepia is 22.2 billion, which are distributed as shown above.

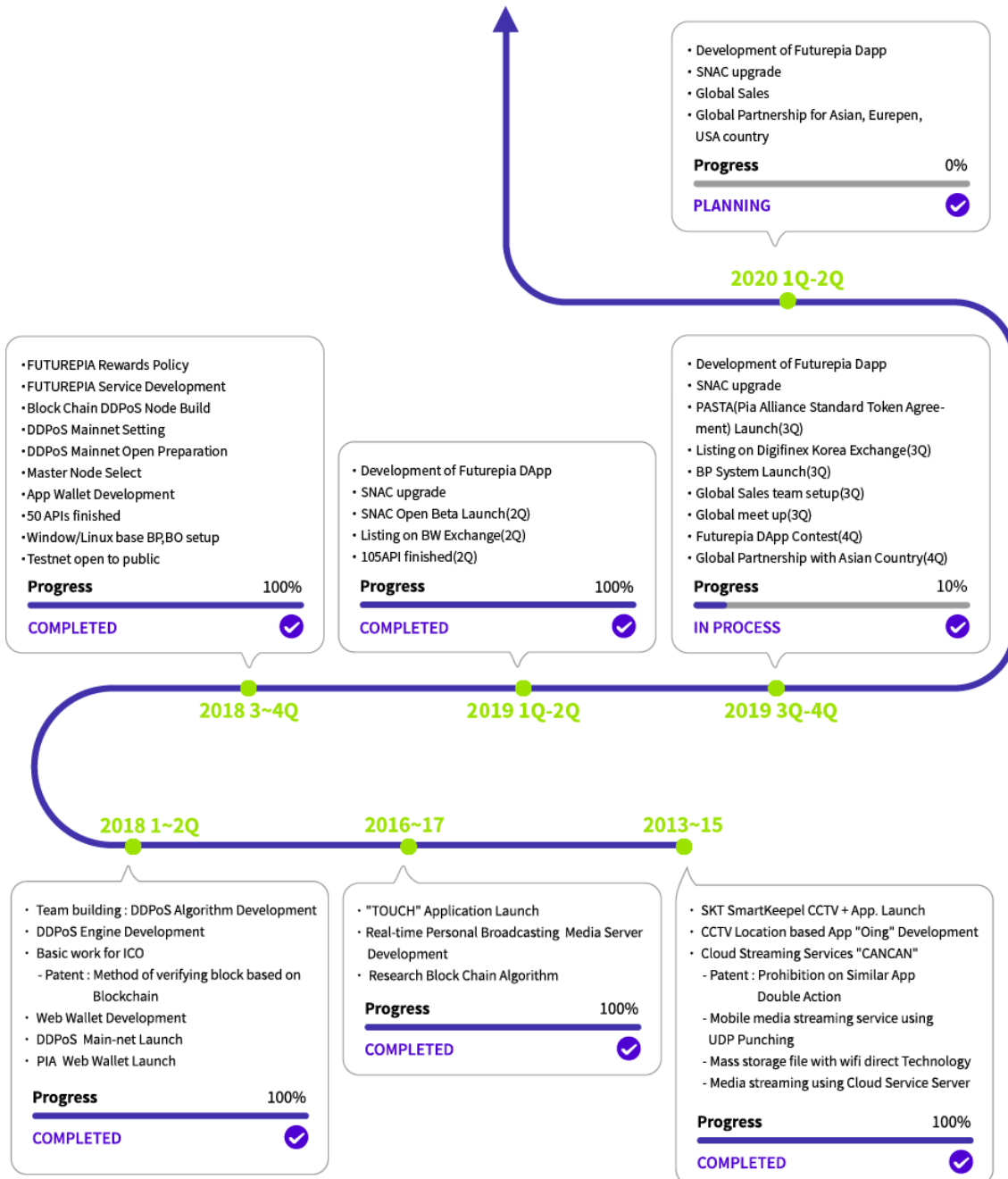
There are plans to offer 6.66 billion (30%) of the coins for sale.



<Fig. 17. Proceeds Allocation Ratios>

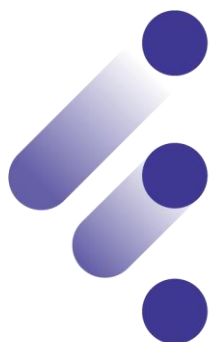
The proceeds from selling 6.66 billion coins will be allocated as shown above.

9. Roadmap



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FUTUREPIA

Notice & Caution

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The information provided in this White Paper is just an indicator, and this White Paper is a document aimed at conveying information.

This White Paper may be revised without notice. The matters regarding development specified in this White Paper and in the future revisions are not guaranteed. The roadmap presented in this White Paper are for reference purposes only. The roadmap is subject to change, depending on the progress of development and the circumstances of the company.