



YOYOW White Paper 3.0

YOYOW—A blockchain based content rewards network

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Overview

YOYOW, named from “You Own Your Own Words”, is a blockchain-based network aiming to quantify contribution and give rewards of participants in the content producing sector with decentralized consensus methods so that content producers, content investors, curators, and consumers of the content ecosystem can be provided with incentives and returns as appropriate.

YOYOW is designed for establishing a rational content-generated income distribution mechanism and a value network based on users' ratings on content. Any content platforms (including but not limited to websites and APPs), regardless of their themes presented in the format of text, video, image, audio or live broadcast, etc., are eligible to create the corresponding content-oriented incentive platforms based on the YOYOW network. Content producers, content investors, curators and builders of the content ecosystem will be rewarded according to the YOYOW eco-environment and users' ratings of content.

Chapter 1 Design Philosophy

1.1 Industry background and development motivation

In the past few years, active users, quality content producers and spreaders brought massive traffic and huge profits to social networks (e.g., Facebook, Twitter, Reddit, Weibo, Zhihu) and user-generated content (UGC) platforms. However, these users never have absolute control over the content created by themselves, and neither do they amply enjoy the generated profits and advantages.

Taking Zhihu for example, the website presently has over 65 million registered users. During 2016, Zhihu users contributed over 6 million questions, 23 million answers and 1.51 million articles. With the powerful user base, Zhihu is worth over USD 1 billion after Series D funding. Yet, except respect from other users, the high-quality content producers who help create Zhihu's value get no monetary rewards.

We believe Zhihu is more than willing to provide quality content producers with reasonable returns since high-quality UGC is always the core of Zhihu's value. However, considering that UGC is not a direct source of value, it is extremely difficult to set an appropriate price of fragmented UGC. As a result, UGC beneficiaries—the platform and its readers, fail to reward the content producers in a rational way. In general, the UGC sector urges a reasonable incentive system to encourage quality content producers.

Powered by blockchain technology, we come up with a solution to the problem. Specifically, a blockchain-based decentralized public ledger and a set of consensus algorithms have been developed to establish a reasonable incentive system for the UGC sector—which enables automatic income distribution by means of specific algorithms and according to users' ratings.

1.2 Development direction

In addition to content rating and equity stake allocation, YOYOW also makes other creative attempts. In structural terms, YOYOW is not simply a textual content-based platform; instead, it is a blockchain-based decentralized public network that achieves content production-oriented contribution assessment and equity stake allocation using the Graphene toolkit technology.

Blockchain is a decentralized value network and YOYOW is expected to become a public blockchain network centering on content rating and attract numerous third-party developers and manufacturers to build up different content-oriented incentive platforms based on YOYOW. During the early stage, YOYOW will provide comprehensive assistance to platform builders if necessary.

YOYO token is the only basic token in circulation in YOYOW network. Therefore, it is applied to rating weight and returns in different content platforms. Meanwhile, according to the medium-term development plan, YOYOW network will allow content community platforms to release their own smart tokens on the basis of YOYO token.

The advertising system plays an important role in stimulating token circulation in YOYOW network, with which, merchants may publicize their commodities and services by launching campaigns while platform builders can achieve good returns. As specified in the medium-term development plan, YOYOW network will be provided with a self-service advertising platform.

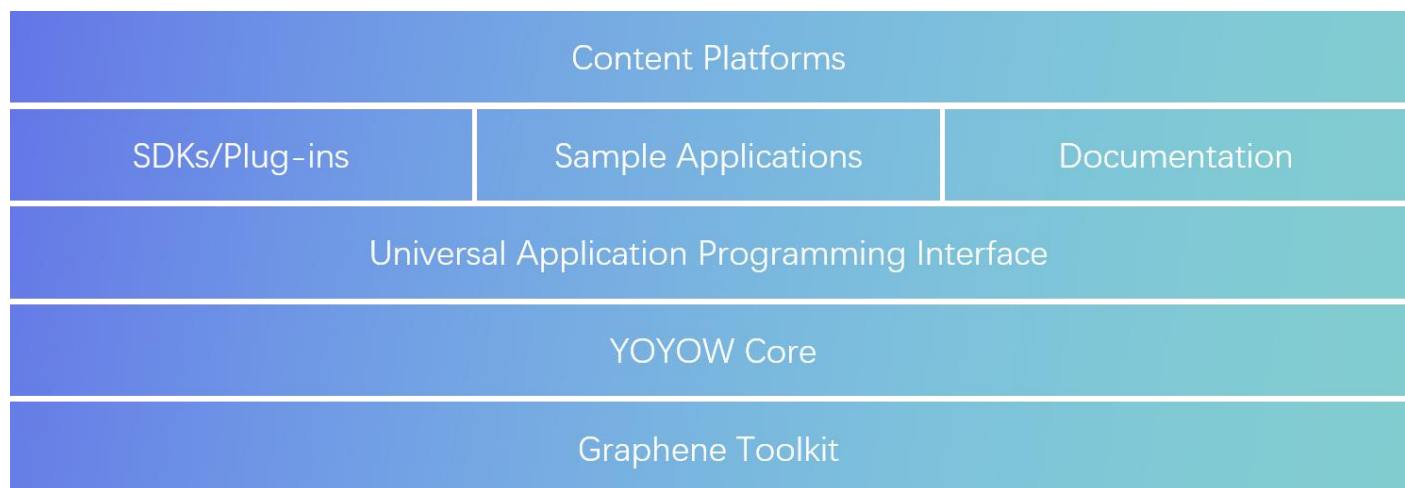
Chapter 2 Technical Details

2.1 Use of token

YOYO token, as the basic system token, can be used to:

1. Give a particular weight of the content for rating;
2. Apply to be a witness with a specified amount of YOYO tokens as collateral;
3. Apply to be a platform with a specified amount of YOYO tokens as collateral;
4. Generate bonus points offsetting against transaction fees;
5. Achieve value transmission as a medium.

2.2 Platform model



YOYOW is mainly composed of five layers:

The bottom layer consists of a modified Graphene toolkit to provide underlying blockchain services, such as block format, consensus algorithm, network, database, user and permission management services. The Graphene toolkit is a bottom layer built on blockchain technology that features its high availability, excellent performance and low latency and allows fast transaction confirmation at

the average speed of 1.5s and enables efficient multi-transaction processing (3,300 transactions per second).

YOYOW Core is the core layer in charge of the core business logics, such as rating logic implementation, permission and login management, rewards distribution algorithms, community platforms and the advertising system.

The universal application programming interface (UAPI) provides third-party developers with APIs for content production, rating and user management so that any platforms with development capabilities can directly use these APIs to carry out in-depth development.

Software development kits (SDKs), plug-ins, sample applications and development documentation offer assistance to developers and users who have built up their own content platforms. Particularly, users can employ a series of plug-ins to directly integrate YOYOW network on forums, blogs and CMS.

Content platforms based on YOYOW network are on the top. Any platforms theming on texts, videos, images, audios and live broadcast can be provided with the corresponding content-oriented incentive platforms powered by YOYOW network.

2.3 User roles

Users

Users can publish, repost, comment, reward and grade content on content platforms. At the same time, the core of a delegated proof-of-stake consensus mechanism lies in voting and thus every user holding the token of a system has the right to vote, with the holding YOYO tokens as the voting weight.

The voting mechanism allows users to elect committee members and witnesses and express their opinions about relevant issues concerning the platform's development—which lay foundations for the establishment of an autonomous community.

Except for direct participation in voting, users may authorize other trustworthy accounts to perform their voting rights.

Committee

The Committee oversees the management of YOYOW network. Committee members are elected by users and entitled to bring forward proposals and vote for resolutions.

One of the Committee's major responsibilities is adjusting variable system parameters if necessary, and these parameters include:

Charge-related parameters: Transaction fee rates;

Content rating-related parameters: Max. cumulative coin days, max. rating weight basal factors,

daily reward budgets;

authentication delegation-related parameters: Charges and subsidies for any third-party content platforms implementing to the network;

Block generation-related parameters: Block generation intervals and block rewards;

Meanwhile, matters concerning the Committee's interests will not be determined by the Committee.

Authorized registrars

Authorized registrars are appointed by the Committee. Unlike BitShares or Steem, one must complete registration procedures with an authorized registrar to open an account in YOYOW network. Additionally, the said authorized registrar is entitled to grant/withdraw such account holder's right of posting anything on platforms and verify/take back the account name (alias). If any authorized registrars have been dismissed by the Committee, all accounts opened with such authorized registrars will be taken over by other authorized registrars. Accordingly, the corresponding rights and obligations will be transferred at the same time.

Witnesses

Witnesses of YOYOW system are responsible for collecting the broadcast transactions during network operation and pack them into blocks. They are in a position as that of block producers(miners) in the Bitcoin network, which employs the proof-of-work (POW) system and the hashrate-dependent betting method to determine which block producer should undertake a new

task of block generation. In contrast, YOYOW network is built on the DPOS mechanism. Thus, the Committee is in charge of determining the number of witnesses by voting while users are responsible for the selection of witnesses. The selected active witnesses are required to pack transactions and produce blocks in order. After each round of block production, the witnesses will be rearranged randomly to proceed to the next round of block generation. Because witnesses are responsible for processing transactions and maintaining the network, they will be given YOYO tokens as rewards according to the processed transactions.

In YOYOW network, an user may be put to a vote to be a witness or apply for the position by submitting a specified amount of YOYO tokens as collateral.

Platforms

Platforms refer to service providers in YOYOW network that provide content storage, user interaction and authorized login services. Any third parties may register as platforms by contributing a specified amount of YOYO tokens as collateral. At the same time, the Committee is entitled to revoke such registrations and confiscate the corresponding deposits kept by the system provided that the said platforms have violated the community consensus/provisions.

Users can authorize any platforms via YOYOW wallet to perform their authentication privileges, which enables cross-site login, single sign-on, content rating, publication and comment, etc. Yet, because it is a delegated authentication with limited access permission, the authorized platforms are restricted to execute any key operations (e.g., asset transfer from users' primary wallet). Besides,

these platforms have no access to users' keys, which ensures asset security and maintains system openness at the same time. Users may cancel the authorization anytime.

Content platforms will be proportionally rewarded with interests and advertising-derived revenue by the content-oriented incentive platform so that they can be motivated to keep providing high-quality service for users. YOYOW network itself does not store any content but the hash values of content. On the other hand, content platforms achieve profitability by sharing the content produced by their users. Considering that the cost of storage equipment, for the moment, is extremely low, we expect the content platforms to provide users with general content storage service for free or at an affordable price. For those demanding distributed content storage, plenty of backup platforms that provide synchronization/backup services are available. Users can entrust content with multiple backup platforms by paying them YOYO tokens and the corresponding content will be placed in other decentralized content storage blockchain networks as backup data (e.g., storing the content in Sia or IPFS network). Because the hash values of the entrusted content have already been recorded in YOYOW network, the content cannot be altered by any platforms without being noticed.

In addition to content platforms, YOYOW network will also set up other content-oriented platforms, such as community platforms, content aggregation platforms, copyright protection platforms, that support in-depth development via UAPI powered by YOYOW network.

2.4 Content ratings and incentive system

The POT (Proof of Taste) content rating algorithm based on the principle of income distribution dependent on net positive rating weight is applied to YOYOW network.

Voting weight and coin days

Content ratings can be divided into positive and negative ones, with the former on a scale of 0 to 5 and the latter of -5 to 0. Users consume coin days in content rating

Assumed that an account holds a specific amount of YOYO tokens, it starts to accumulate coin days over time until the maximum value $MAX_ACCUMULATE_DAY * YOYO_BALANCE$, where $MAX_ACCUMULATE_DAY$ denotes a system parameter and $YOYO_BALANCE$ represents the amount of YOYO tokens held by the account.

Content rating requires consumption of coin days, which involves another parameter-single rating consumption factor, i.e., $VOTING_CONSUM_FACTOR$, which is determined by the account user independently and employed to specify the proportion of consumed coin days per content rating that is expressed by $VOTING_CONSUME_FACTOR * YOYO_BALANCE$.

If $MAX_ACCUMULATE_DAY = 7$ and $VOTING_CONSUME_FACTOR = 0.2$, the user can carry out effective ratings for five times with the accumulated coin days per day. However, there is an upper limit of daily rating: every user is only permitted to make ratings for no more than 35 times a day (excluding ineffective ratings) regardless of the accumulated coin days.

Different criteria are applied to the consumption of coin days of positive and negative ratings and the Committee is responsible for adjusting the proportions appropriately through system parameters.

The concept of coin days is introduced in order to:

1. Prevent active users from occupying an excessive voting weight;
2. Avoid large-scale voting weight acquisition by spam users.

The voting weight of a single effective rating no matter positive or negative can be written as $RATING_FACTOR \lg[\text{int}(\text{CONSUMED_YOYODAYS})]$, where `CONSUMED_YOYODAYS` means the consumed coin days of such rating and `RATING_FACTOR` represents a system parameter under control of the Committee, which is used for adjusting the effect of coin-day holdings on the voting weight. If `RATING_FACTOR = 1`, all effective ratings are completely consistent with the generated voting weight and not correlated with the consumed coin days. If `RATING_FACTOR = 10`, the voting weight is in positive correlations with the consumed coin days. According to our plan on the initial YOYOW network, `RATING_FACTOR = 2`, i.e., the voting weight will be doubled by consuming 10x coin days. On this basis, voting weight remains positively correlated with the consumed coin days, which prevents influential accounts from exerting decisive impacts on content voting weight.

Bonus points are also derived from coin days to offset transfer charges. When paying transaction fees, users may spend their bonus points.

Content curators

To encourage content curators to dig quality content, users first “like” any new content that has been published for only a few days will be proportionally rewarded with the incomes of the corresponding content.

With the content investment model being introduced to YOYOW network, the incomes derived from content will be distributed to content authors and investors.

Rating period

The system parameter `RATING_EXPIRATION_DAYS` has defined a valid period of rating. If `RATING_EXPIRATION_DAYS = 30`, ratings within 30 days from publication will be included in income distribution; on the 30th day, the system will calculate the content author's receivable income, which can be expressed by:

$$\mathbf{REWARD[x] = DAILY_RATING_BUDGET * VOTING_WEIGHT[x] / \sum VOTING_WEIGHT[x]}$$

Where `VOTING_WEIGHT[x]` represents the net voting weight of content ($VOTING_WEIGHT[x] \geq 0$).

The formula indicates that upon expiration of the rating period, the income distribution is subject to the net voting weight of content.

The production of high-quality content is in a virtuous circle. In terms of Zhihu's operation model, high-quality questions are likely to bring high-quality answers. Hence, it is necessary to reward the content that gives rise to more high-quality content. In YOYOW network, part of the receivable income of content will be distributed to its parent content in a specific proportion determined by the system parameter `PARENT_REFUND_RATIO`.

Prosecution period

Upon expiration of the rating period, the receivable income derived from content has to undergo a lockup period before being distributed to the corresponding authors in case of infringement.

At the same time, to prevent malicious authors from publishing any infringement or rule-violating content, the Committee is entitled to freeze the said content. Frozen content is not available for rating and thus the content authors will gain no returns from such content.

Tipping

Except for the above-mentioned incomes depending on content rating, users may directly tip content authors with YOYO tokens.

2.5 Authentication system and login methods

In YOYOW network, every user has a unique identification number—YOYO number that allows him/her to enjoy diverse services provided by different platforms.

Additionally, based on the problems reflected by the authentication management systems of BitShares and Steem, YOYOW has modified the authentication system built on Graphene toolkit and introduced the delegated authentication with limited access permission mechanism according to the principle of least privilege. Users may authorize any platforms to exercise their authentication privilege whereas the authorized platforms cannot access users' keys in the process so as to maintain a high level of security and better user experience. Moreover, the secure cross-

site login and SSO techniques are applied to the platforms, making it a cluster of platforms that have diverse styles and offer distinct user experience.

2.5.1 Authentication system

YOYOW provides four levels of keys having different privileges:

Owner key: The owner key is at the highest level and is used for management of all privileges of an account.

Active key: The active key is designed for transfer and loose change management.

Secondary key: The secondary key controls the operation access and loose change of a content platform.

Remark key: The remark key provides access to transaction remarks.

In case of login via mobile devices, users are required to use their limited access permission keys to maintain account security. The owner key has control over all privileges and allows its user to reset other limited access permission keys.

Authentication privilege: The authentication privilege is independent of the key system to enhance security and improve platform user experience.

2.5.2 OAuth cross-site login

OAuth is an open standard for access delegation. It specifies a process for users to authorize third-party access to specific data hosted by other service providers with access tokens.

A platform can realize cross-site login or binding functions (with WeChat, Twitter, Facebook, Alipay and Weibo accounts) as long as it adopts the open standard and YOYOW's authentication delegation mechanism. The detailed procedure is as follows:

1. Users authorize a login site via YOYOW wallet;
2. The login site jumps to the OAuth destination site (e.g., WeChat, Twitter, Alipay) and requests authentication delegation.
3. The two-way binding is completed upon authentication delegation of the OAuth destination site;
4. To login, users may use access tokens provided by the OAuth destination site.

2.5.3 Single sign-on (SSO)

YOYOW wallet has a platform list that specifies the authentication delegation mechanism, following which, users may directly select any services provided by the platforms on the list after the first time signing on YOYOW wallet. No login process is required and YOYOW wallet will automatically jump to the selected platform in a login status.

2.6 Content publication, repost and comment

Publication

YOYOW network does not store any content (the storage task is undertaken by platforms in the network), and yet it records the hash values of content as the unique basis for authentication. To minimize the risk of potential hash collision, YOYOW employs multiple hash algorithms to store hash values in a head-to-tail order. The storage structure is as follows:

Result of hash algorithm 1 + result of hash algorithm 2 + result of hash algorithm 3 + result of hash algorithm N....

Repost

In YOYOW network, original authors are provided with repost permission settings and license agreements (e.g., Creative Commons license agreements) If an original author grants repost permission, he/she will obtain no less than 20% of the incomes derived from the reposted content. Moreover, the reward incomes will also be distributed to the original author proportionally.

Comment

Users can make comments on content displayed by platforms. Considering that users' comments are also valuable assets, comments in YOYOW network are also available for rating and reward.

2.7 Content income distribution

The content income distribution function is another creative attempt of YOYOW network. With this function, users can invest in exceptional content produced by other users and gain returns from the investment while content producers (whose content has attracted investment) can receive lump-sum payments from the investors and obtain the following incomes derived from their content.

Content producers, when publishing any content, can specify the investment model, alienable income shares and investment deadline. During the investment period, content investors may

make an investment in any content and the corresponding content producers will be granted lump-sum payments as rewards. After the lockup period, the incomes generated by the content will be automatically allocated to the content producers and investors according to their holding shares as specified in the smart contracts.

2.8 Community platforms and the corresponding smart token

In YOYOW network, community platform is defined as a special platform similar to Xiaomiquan. Users are allowed to create their private community platforms and require other users to pay a specified amount of YOYO tokens or obtain the platform administrators' approval when applying for membership of their community platforms. Meanwhile, community platform administrators have the right to set the internal income distribution ratios and establish internal fund pools for their platforms. YOYOW advocates human resources, economic and content autonomy of community platforms.

Except for the features above, community platforms are also allowed to release their own smart tokens. These smart tokens are endorsed by the incomes derived from content rating and reward for high-quality content produced by platform members. For instance, a "community platform A" may issue its own smart token "community platform A token" and specify that 20% of the incomes obtained by all members of the "community platform A" will be evenly distributed to the "community platform A token" holders. Members of the "community platform A" can obtain initial shares upon issue of the smart token. The rest 80% of the incomes will be distributed according to another type of untransferable assets: WORD of the community platform, which is an automated

income distribution mechanism subject to the automatic implementation of the smart contract.

WORD is designed as a type of untransferable and intradable assets and distributed to community platform members in YOYOW network. WORD holders are entitled to decide the content-oriented incentive measures of their community platform. When a member of the “community platform A” publishes content, the hash values of the content and other relevant data will be recorded in YOYOW's blockchain at the same time. When other members of the “community platform A” read and assess the content, the rating data will also be recorded in YOYOW's blockchain. In the end, the distributable incomes for participants will be determined by means of the POT algorithm. Based on the settings of the “community platform A”, such incomes can be represented by the YOYO tokens owned by the “community platform A” or other assets issued by the platform via YOYOW network. The “community platform A” can determine the WORD distribution and the proportion of income distribution to content producers.

2.9 Advertising system

The advertising system is established to increase the liquidity of YOYO tokens and strengthen the profitability of platforms. Generally, online advertisements are charged by time and space. However, there are also other charging models, such as “click rate-dependent” and “pageview-dependent” ones. Considering the high incidence of click rate/pageview fraud and the difficulty of employment of Oracle and other mechanisms to support the blockchain system, during the early stage, YOYOW will not introduce or develop any click rate/pageview-dependent charging models. Instead, the commonly used “time and space-dependent” charging method will be introduced to YOYOW

network.

BuySellAds.com is a globally leading online advertising market that mainly engages in selling time-dependent online advertising space on behalf of website owners. YOYOW intends to adopt a similar model and more specifically, build an advertising market in the YOYOW wallet. In the advertising market, there will be diverse choices of advertising space and charging standards of different platforms. Meanwhile, the performance and historical data (e.g., incomes, quantity of content) of these platforms will be disclosed for users' reference. A user may directly rent advertising space with YOYO tokens and provide advertising placement with approval of the corresponding platform. The duration and position of the advertisement are subject to the smart contract by and between the user and the platform.

Chapter 3 Application Contexts

3.1 Social media platforms

With the content-oriented incentive and reward mechanisms provided by YOYOW network, a platform can establish social media platforms based on textual content like Steemit and further develop social networks as large as Twitter and Facebook.

3.2 Blog, encyclopedia and forum platforms

Blog, encyclopedia and forum platforms still occupy considerable market shares, especially those built on blogs and encyclopedia that provide access for users to publish formal content in a textual format. Over decades, these content platforms have always been strongly dependent on their advertising clients and most of their users cannot obtain any returns. To solve these problems, YOYOW provides multiple plug-ins to directly introduce the content-oriented incentive and reward mechanisms to these platforms. In this way, more incomes can be brought to content producers and platform builders.

3.3 Q&A platforms

The Q&A platforms such as Zhihu and Quora have long been hindered by the liquidation problem, which can be solved by YOYOW's rating, incentive and reward mechanisms. Compared to direct payments, it is more effective to motivate outstanding users with reasonable rewards based on content rating and the users appear to show a greater conversion rate and a higher level of participation.

3.4 Traditional websites

Advertising has been a major source of income for traditional websites while there are no incentive measures for the acquisition and cataloging departments of these websites. The content-oriented incentive and reward mechanisms provided by YOYOW platform can be applied to these traditional websites in order to motivate their acquisition and cataloging departments and increase their incomes. Besides, community platforms can be established to issue smart tokens and use these smart tokens to fairly distribute the incomes derived from the incentive and reward mechanisms to the acquisition and cataloging departments according to smart contracts.

3.5 VOD/live broadcast platforms

Video platforms are faced with the problems about liquidating content and increasing profitability. Considering the characteristics of video websites, bandwidth and storage costs are heavy burdens to a web host and make it difficult to achieve profitability. Most typically, the world's largest video website YouTube is still in deficit. Video live broadcast and VOD websites can adopt YOYOW's content-oriented incentive and reward mechanisms to bring more incomes to content producers and their platforms.

3.6 Content aggregation platforms

Content aggregation platforms can make use of YOYOW's embedded repost function to achieve content aggregation similar to that of Tiantian Toutiao. Additionally, automated programs can be employed to select appropriate content and push the content to target readers. With the repost function, authors and reposting users can gain returns from the rating and reward mechanisms.

3.7 Witness and copyright protection service

Because the unique hash values of content recorded by YOYOW cannot be altered, platforms can collaborate with legal institutions to provide content witness and copyright protection service.

Chapter 4 Ecosystem

4.1 YOYOW SDKs

YOYOW SDKs provide developers and platforms with advanced development kits, such as robots interfaces, real-time content import, historical content import, user management and cross-site login.

4.2 WordPress, phpBB, Joomla, MediaWiki and Discuz plug-ins

As far as we know, there are plenty of web hosts and users who lack development capabilities expecting to participate in the development of YOYOW network. To satisfy their needs, our team, according to the current development plan, will develop a series of plug-ins based on the existing CMS, blog, encyclopedia, forum programs. By then, users can access YOYOW network by installing these plug-ins to their websites.

4.3 Development support and ecosystem construction

In addition to the development interfaces and SDKs, our team will retain a specific amount of community promotion fund for the purpose of publicity and development support. Specifically, the community promotion fund will be used for holding regular developer meetings, activities and development contests in order to cultivate more developers for YOYOW. We will also establish a developer community where developers can share development resources and exchange ideas.