EpiK Protocol

Governance Whitepaper

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Vision

“EpiK” was derived from “Epigraphic Knowledge”, which means the deciphering of knowledge previously recorded on stele. At EpiK Protocol, we envision to build a global collaborative decentralized knowledge graph by applying four core trusted capabilities – trusted storage, trusted incentive, trusted governance and trusted finance, to organize the collaboration among global knowledge community users with an extremely low costs. Thus transferring human knowledge in various domains into an eternal knowledge graph, which broadens AI’s horizons and usher in the era of cognitive intelligence.

Catalog

1 Background

In EpiK Protocol Whitepaper, we describe the responsibilities of four core participants, namely domain experts, bounty hunters, knowledge nodes, and knowledge gateways, and introduce the benefits of these four core roles in EpiK Economic Whitepaper. Among them, the domain expert is responsible for defining human knowledge as a knowledge graph format that AI can understand, then organizing the collection and acceptance of knowledge graph data, and filling these data into the corresponding domain of on-chain knowledge graph database for all community members to share, then obtain corresponding benefits according to the amount of contributed data. Bounty hunters assist domain experts to complete manual collection and acceptance tasks, help domain experts to complete the work that automated tools cannot complete, then obtain corresponding benefits according to the amount of completed tasks; The knowledge node is responsible for storing the knowledge graph data of each domain on the chain and providing data download services, then obtain corresponding benefits according to the number of stored files; Knowledge Gateway is responsible for paying corresponding costs to download the data on the chain according to different domains and provide high-speed data access service to the outside by building the data index locally. When EpiK Mainnet 1.0 "Rosetta" is launched, we will set a default value for each parameter in the economic model. However, with the development of EpiK ecology, the value created by different roles is constantly changing dynamically. In order to ensure the sustainable development of EpiK community, the community needs to be able to dynamically adjust the resource allocation scheme among these four types of characters, this is the original intention of EpiK governance model design.

2 Principle of Design

Governance itself does not directly solve conflicts, but it provides tools to solve conflicts. The purpose of EpiK governance model design is to provide the EpiK community with a tool to solve the local conflicts to obtain the overall benefit maximization. To achieve this goal, we followed two basic principles when designing the governance model.

2.1 Principle of Information Disclosure

In the EpiK governance model, we will adopt the form of Decentralized Autonomous Organization (DAO) for decentralized governance. DAO is a form of proposal governance with the help of blockchain smart contract. In DAO, all proposals, votes and execution information will be disclosed and

recorded on the blockchain in real time and no one can temper with it. All members of the DAO community can supervise and participate in the whole process of governance without permission.

2.2 Interest Relevance Principle

In the EpiK governance model, everyone only has the right to vote in proposals related to their own interests. This means that the voting power of the same account in different proposals is different, and power size depends on the interest relevance degree between the account and the proposal. Completely irrelevant, voting power is 0; the deeper the degree of relevance, the greater the voting power.

3 EpiK DAO

In this chapter, we will introduce EpiK DAO from four parts: Proposals, Votes, Rulings, and Awards.

3.1 Proposals

Anyone can initiate a proposal, but in order to prevent too many meaningless proposals from occupying community governance resources, each proposal will cost 99 EPK, which will be directly destroyed. If you've already read our Economic Whitepaper, you might realize that the Domain Expert Application is a special kind of proposal.

For different needs, EpiK DAO divided proposals into three types, namely referendum proposal, storage ecology proposal and knowledge ecology proposal. The proposal template under each type is shown in Table 1.

Referendum Proposal		
Set a penalty for a domain expert when this domain expert nominates a bad domain expert. That is, the amount of extra votes needed that punished domain experts should have in order to activate themselves. The default is 25,000 votes.	Set the buffer time for Domain Expert invalidation. That is, the number of days after the number of activation votes is less than the required number of votes need to be replenished, otherwise all previous data contributions will be lost. Default is 3 days.	Sets the minimum number of votes for domain expert activation. Default is 100,000 votes.

Set the lock-in time for the domain expert reward withdraw, that is, how many days after applying for withdrawal, the reward can be withdrawn. Default is 7 days.	Set the lockup period of the block revenue from Coinbase, that is, how many days after revenue start to unlock. Default is 7 days.	Set how many days does it take to linear unlock all revenue when block revenue starts to unlock. Default is 7 days.
Set how much EPK for the basic deposit of the knowledge node. Default is 1,000.	Set how much data can be downloaded for the access deposit of 1 EPK. Default is 10 Mib.	Set bandwidth rewards for providing 10 Mib data download services. Default is 0.0002 EPK.
Set the lock-up period for applying withdrawal of EPK used to vote for domain experts. Default is 3 days.	Set a lockup period for applying withdrawal of basic deposit Default is 0 days.	Set a lockup period for governance reward withdrawals. Default is 3 days.
Set a lockup period for applying for a withdrawal of access deposit. Default is 3 days.	Set the allocation ratio for the new EPK output. The default is, Knowledge Node 75%, Domain Expert 9%, Governance Vote 1%, Knowledge Fund + Access Fund 15%.	Set the ratio of knowledge fund and bonus pool to divide new EPK output, that is, if the ratio of access deposit /total circulation is higher than what amount, all of it will be distributed to Access Fund, otherwise, it will be distributed to Access Fund according to this ratio. Default is 75%.
Storage Ecology Proposal		
Set the top number of nodes that store new files can get double computing power. Default is 100.	Sets how many blocks a Tipset can contain on average. Default is 5.	Block domain experts who illegally brush data or upload junk data makes all the data contributed in the domain invalid.
Knowledge Ecology Proposal		
Change the domain expert owner to avoid the domain expert forgetting the private key.	Set the effective time for changing the domain expert owner. Default is 3 days.	Block domain experts who illegally brush data or upload junk data makes all the data contributed in the domain invalid.

Set weight calculation method of domain experts, that is, take several root signs to the real contribution data size to calculate their respective weights. Default is 3 times.	Set the receiving address of the knowledge fund, which is used to issue rewards to bounty hunters in knowledge crowdsourcing applications similar to the knowledge mainland.	Set an upper limit on the size of new files that domain experts can register daily to avoid large differences in the size of data between domains, and to reduce the benefits of malicious data brushing. The default is 8 MB.
Set the activation threshold of the domain expert contribution value, that is, how many knowledge nodes store a new file before it is recorded as the real contribution value of domain experts to participate in the sharing of rewards. Default is 10.		

Table 1. List of EpiK governance proposals

When we need to initiate a proposal, first, we select the proposal category, then select the specific proposal template, and list the options that we want to change one by one. Then, in accordance with the principle of information disclosure, the proposer needs to send the proposal transaction and spend 99 EPK to submit and broadcast the proposal to the whole network, so that all members of the EpiK community can see the proposal.

The valid voting time of each proposal is 5 days. In order to avoid causing unnecessary disturbance to the community, two proposals with the same template cannot appear at the same time. In addition, the total number of pending proposals at any one time cannot exceed 5 cases.

3.2 Votes

In EpiK DAO, each proposal is assigned to one of three types: Referendum Proposal, Storage Ecology Proposal, and Knowledge Ecology Proposal, and there is one and only one type of the same proposal. The criteria are set by observing the impact scope of each proposal. Because each proposal influences different range of users, according to the principle of interest relevance, the way to participate in voting for different types of proposals is also different. Let's introduce them one by one.

3.2.1 The Referendum Proposal

A referendum proposal is a proposal that is relevant to the interests of all token holders and more directly, it is a proposal that affects the supply and consumption of tokens in circulation through the network. For example, setting a minimum number of votes for domain expert activation directly affects the total number of tokens that are withdrawn from circulation due to participation in the domain expert vote.

Referendum proposals are the type of proposals with the largest scope of influence. Because they are related to the interests of all token holders, all token holders can vote. Moreover, following the principle of interest relevance once again, token holders who are more closely related with the interests of the referendum proposal should have more voting power. The specific way to obtain the voting power of the referendum proposal is shown in Formula (1).

$$weight(i) = LockedEPKForReferendum(i) \quad (1)$$

Each token holder's voting power is equal to the number of EPKs they have locked up for participating in voting on the referendum proposal. It should be noted that this part of locked EPK can apply for withdrawal at any time, but there is a 90-day lockup period after the withdrawal application, EPK can only be withdrawn after the lockup period. The reason for the long lock-up period is to avoid centralized exchanges or centralized token custody services use users' EPK to participate in governance, which leads to the excessive concentration of voting rights, hurts overall interests.

Token holders who participate in the governance of the referendum, like those who participate in voting domain experts, all need to lock EPK, which means they need to lose the liquidity value of their EPK holdings. Therefore, just like voting for domain expert, users who participate in the referendum governance vote will also be able to share the governance rewards, specific rewards scheme is described in detail in the Rewards section of this chapter.

3.2.2 Storage Ecology Proposal

The storage ecology proposal refers to a proposal that is only related to the interests of all knowledge nodes. For example, top number of nodes that store new files can get double computing power. This proposal will only affect the difficulty of knowledge nodes to get double computing power, thus affecting the income gap between each knowledge node.

According to the principle of interest relevance, all knowledge nodes can participate in the voting of the storage ecology proposal, and the distribution of voting power is shown as below.

$$weight(i) = RawBytePower(i) \quad (2)$$

The voting power of each knowledge node is equal to the amount of original computing power they have. Note, here the weight of vote is the original value of the knowledge nodes, and it is different with effective computing power, under normal circumstances, effective computing

power of knowledge nodes is the same as original value of knowledge nodes, but if knowledge nodes are lucky enough to get a file's double computing reward, the extra computing power will be added to effective computing power, original computing power will not change by the double computing power rewards.

Unlike token holders who participate in the referendum proposal, they need to lock EPK in order to get voting rights. Knowledge nodes participating in the governance of storage ecology proposals have the right to vote at no additional cost. Therefore, knowledge nodes that participate in voting for the Storage Ecology proposal will not receive additional governance incentives.

3.2.3 Knowledge Ecology Proposal

A knowledge ecology proposal is a proposal that is relevant only to all knowledge data producers. For example, setting the method of calculating the weight of domain experts, this proposal will only affect how the domain experts distribute the benefits according to their contributions, and has nothing to do with non-domain experts. Of course, besides domain experts, bounty hunters are also producers of the knowledge data, and proposals that relate to the interests of bounty hunters are also part of the knowledge ecology proposal. For example, setting the address of the knowledge fund directly affects the rules for the distribution of bounty hunters' earnings.

Although both domain experts and bounty hunters are related to knowledge ecology proposals, bounty hunters themselves are token holders, and domain experts are elected by token holders' votes. In order to improve the decision-making efficiency of knowledge ecology proposals, only domain experts are allowed to vote for knowledge ecology proposals here. If the vote of the domain experts can not represent the appeal of the bounty hunters, bounty

hunters can cancel the vote of the domain expert, thus will not violate EpiK DAO's principle of interest relevance. Domain experts will participate in voting of the Knowledge Ecology proposal, and the distribution of votes is shown as below.

$$\text{weight(i)} = \begin{cases} 1 \text{ if user(i) is an active domain expert} \\ \text{otherwise, } 0 \end{cases} \quad (3)$$

That's one vote for one domain expert. Like the knowledge nodes that participate in the voting of the storage ecology proposal, domain experts do not have to pay extra costs to participate in the voting of the knowledge ecology proposal, and therefore do not receive additional governance incentives.

3.3 Arbitration

No matter what kind of proposal, voters can change their choice during 5-day voting period of the proposal, and the voting rights are calculated based on the votes held by voters in the last vote during the voting period.

In order to avoid a proposal becoming effective without sufficient discussion, EpiK DAO set two arbitration conditions for the proposal to become effective. The first condition is that each proposal needs to have more than 33% of the valid votes on the ballot, and the second condition is that the option with the most votes need to have more than 50% of the total votes on the ballot. Here we explain one of the three types.

According to the arbitration rules, for referendum proposals, the number of effective votes is the total number of votes for which all tokens in circulation are used to vote. The number of effective votes for a referendum proposal is the same as the total amount of tokens in circulation when calculated according to Equation (1). This means that if the total amount of tokens in circulation is 10,000,000 EPK, the amount of effective votes is 10,000,000, then the total amount of votes to participate in the referendum proposal would need to exceed 3,330,000 to trigger the first condition of the ruling, which means that more than 3,330,000 EPK are locked to participate in the referendum vote. This condition is not easy to achieve, so the referendum proposal is a decision that requires careful consideration by the community. In addition, if a referendum proposal has more than one option, then the vote will be spread among the options, and one option will need to achieve more than 50% of the votes to trigger the second condition of the ruling. After the two conditions of the ruling are met, the result of the referendum proposal will be automatically executed by EpiK DAO.

For the storage ecology proposal, the valid votes are the sum of all the original computing power of the whole network. Assuming its value is 3T, the first condition for triggering the ruling requires that more than 1T of the original computing power holders participate in the voting, and the second condition requires more than 50% of the original computing power holders over 1T vote for the same option. In this way, the results of the storage ecology proposal will be implemented. For the knowledge ecology proposal requires more than 33% of the domain experts participate in voting, and when more than 50% of these domain experts vote for the same option, the voting result will be executed.

3.4 Rewards

Users who participate in the storage ecology proposal and knowledge ecology proposal do not have to pay additional costs in order to obtain voting rights, so they will not receive additional governance incentives. Users who participate in the referendum proposal are different, they will need to lock extra EPK to get the right to vote, so EpiK DAO designs additional incentive for them.

As described in the economic whitepaper, on the EpiK mainnet, a Tipset will be generated by every 30s, here will contain 115.2 EPK newly generated tokens, this part of total token amount is 700,000,000, which will last for 50 years. Of these newly generated tokens, 1% will go into the governance bonus pool, which means 1.152 EPK per Tipset will go into the governance bonus pool.

Before EpiK DAO goes live, the only governance proposal was to vote for domain experts, and voting for domain experts also require locking EPK, so the EPK in the governance bonus pool will all distributed to the users who vote for the domain experts.

After EpiK DAO goes live, users who participate in voting for referendum proposals within EpiK DAO will share the 1% governance bonus pool with users who participate in voting for domain experts. However, since the lockup period of withdrawal application for voting domain experts is 3 days, while the lockup period for voting referendum proposals is 90 days, we design an advantage factor for different lockup periods. The longer the lockup period is, the greater the advantage factor is. The proportion of governance rewards in the governance bonus pool of the two kinds of votes is related to the respective total locked EPK and dominance factor, as shown below.

$$Factor(x) = \frac{1}{1+e^{-0.2x}} \quad (4)$$

$$TotalElectionVotesWeight = TotalVotesForDomainExpertElection * Factor(3) \quad (5)$$

$$TotalReferendumVotesWeight = TotalVotesForReferendumProposal * Factor(90) \quad (6)$$

$$ElectionPortion = \frac{TotalElectionVotesWeight}{TotalElectionVotesWeight + TotalReferendumVotesWeight} \quad (7)$$

With the distribution ratio of the two types of voting bonus pools, we can calculate the benefits of users who participate in the domain expert vote and the referendum proposal vote, as shown below. Where, i represents the current token-holding user, and j represents the current Tipset.

$$RewardInElection(i, j) = \frac{LockedEPKForElection(i,j)}{TotalLockedEPKForElection(j)} * ElectionPortion * 1.152 \quad (8)$$

$$RewardInReferendum(i, j) = \frac{LockedEPKForReferendum(i,j)}{TotalLockedEPKForReferendum(j)} * (1 - ElectionPortion) * 1.152 \quad (9)$$

That is, 1.152 EPK from each Tipset goes into the governance prize pool, and then this EPK is proportionally divided into the prize pool of the domain expert vote and the referendum proposal vote. Regarding the token holders who participate in the above two voting categories, they will divide the income of the two prize pools according to the proportion of their currently locked EPK in the two voting pools.

It is important to note that regardless of the type of vote, once you apply for a withdrawal, you will no longer enjoy the benefits of the governance bonus pool, even if you are still in the lock-up period.

4. Conclusion

The goal of the EpiK DAO governance is to continuously fix the resource mismatch in the EpiK community so that for 50 years, new released EPK can be used in the most valuable place in each time period. EpiK DAO will release on Mainnet 2.0, before that, the community can participate in governance through the Snapshot tool, and the voting results will be recorded by the Foundation and modified when Mainnet 2.0 is released.

The governance model serves the economic model, which serves the mission of the project. It will take EpiK 50 years to organize members of the global community to impart human knowledge to AI in the form of the Knowledge Graph. We hope that all the fellow EpiK will have a deep understanding of EpiK, not only participate in contribution to the collaboration of the Knowledge Graph, but also to cast a key vote in the governance of the decentralized Knowledge Graph ecology.